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Annual report of the
Board of Regents
of
West Virginia University

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Annual report of the Board of Regents of West Virginia University, for the year <1870>-<1872>; and,

Biennial report of the Board of Regents of the West Virginia University, <1875 and 1876>-

LLMC 00-494t

THIRD

ANNUAL REPORT

OF THE

BOARD OF REGENTS

OF

WEST VIRGINIA UNIVERSITY,

FOR THE YEAR 1870.

WHEELING:
JOHN FREW, PUBLIC PRINTER.
1871.

REPORT OF THE REGENTS:

To His Excellency, WM. E. STEVENSON,
Governor of West Virginia.

The very full and detailed reports representing the various interests of the State University during the last two years, as well as the papers which accompany this, our Third Annual Report, render it unnecessary for us to enlarge upon the subject here. We refer especially to the statements under the following heads in our report of last year, viz.: Historical developement; departments of instruction; name and scope; funds and endowments; grounds and buildings; cadets; prizes, &c.

The whole Board has been able to attend our present meeting with the exception of Col. J. S. Wilkinson, of the Eighth District. The closing exercises of the year just ended have been to us and to all who attended them, of great interest. The examination of the classes in the studies of the year and such of the literary performances of the students as we have been able to witness, give evidence of earnest and thorough effort on the part of teachers, and of such ability and praiseworthy attainment on the part of the students, as fully justifies all that has been done or may yet be required in the establishment and maintenance by the State of this school of liberal education.

The difficulties which met us at the beginning were many and great—inadequate means, public indifference to advanced education, the possibility of expectation outstripping accomplishment, the liability of the best plans to fail from unexpected contingencies, and the danger of mistakes which might crop out hereafter, are but a few of the dangers encountered. The measure of success which, notwithstanding all this has been secured, is to us a cause of profoundest gratitude.

For this we are largely indebted to the professors of the university, and especially to its president, on whom we had mainly to rely for its organization and management. It has been our earnest endeavor to so conduct this important trust, that, free from partizan, sectarian, or local influences, it may fulfil its high mission of securing the best possible education to all who enter its halls. We hesitate not to say that even beyond anticipation it has realized this result. The general and generous co-operation secured on the part of all interested in the State and the comparatively rapid growth of the university, is its best omen for the future.

The State owes it to the general government which has thus far furnished the greater part of the endowment, to the excellent and learned men who, as professors, have devoted themselves to its interests as well as to itself, and to its youth of noble aspiration and promise, to sustain and cherish its university; and thus in connection with its other schools provide for instruction not only in the elements but also in the higher departments of knowledge. No investment she has thus far made has been more largely, immediately and beneficently remunerative, and thus it has been elsewhere. In those countries, and those parts of our own country that have made most progress in education, in all that strengthens States and nations, in all that elevates and adorns humanity, the people early established the common school and the university. Their action is reciprocally and greatly advantageous; while the former supplies pupils to the latter, the latter elevates and furnishes instruction to the former—each supporting and being supported by the other, and both concurring in the great object of furnishing from the ranks of the rich and the poor, men thoroughly educated for the various pursuits and professions of life.

We appeal, therefore, through you, to the Legislature, for the means required for the permanent prosperity and gradual enlargement and growth of the State University. It has shown itself eminently deserving of this. Its wants are tersely set forth in the Report of the President. The foundation has been well laid, and on it time, means, and proper effort, will realize the ideal of a noble institution. We trust there will be no going back, nor any hesitation to go forward in this great enterprise. The sum required is but as a drop in the bucket compared with the aggregate of good secured thereby. Departments already provided should be enlarged, and new ones added, as soon as the income of the institution will permit.

The Faculty of Instruction have not received the remuneration which the amount and quality of service rendered by them deserve. Additions are required to the furniture, the library, the apparatus and general facilities of the University. The following resolution from our proceedings has been heartily and unanimously passed by the Board, viz.:

"*Resolved*, That in view of the great and increasing importance and "value of the West Virginia University as an institute of the Com"monwealth, and in view of the unexpected and extraordinary demands "which are being made upon it by those seeking an education, and "which imperatively require additions to its Board of Instruction and "its facilities generally, we, the Board of Regents, of the said Univer"sity, do most respectfully and urgently request the Legislature of West "Virginia to perfect the endowment fund of the Institution by a con"tinuation of the annual appropriation thereto of the sum of ten thous"and dollars for the term of ten years, and by the appropriation in ad"dition thereto of an amount sufficient to provide for deficiencies in the "current expenses of the University occurring inevitably in the effort "to meet properly the responsibilities devolving upon those in charge of "its interests."

The importance which the Board attach to this matter was again shown by the passage at the last annual meeting of the following resolution:

"*Resolved,* That the Board of Regents renew their appeal to the "Legislature for an endowment for the University as set forth in the "resolution passed at the annual meeting of 1869, and that a committee "of three be appointed to present the same to the Legislature at their "next session and solicit favorable action thereon."

The instructors and professors of the Institution, while discharging duties requiring rare scholarship, peculiar mental endowment, and much experience, are receiving salaries only equal to, or even less, than the lowest grade of Government clerks, whose duties are only mechanical or routine. This ought not to be, and the result is seen in the fact that but two of the original Board of Instruction still remain in the employ of the University, and all those who have left, have done so reluctantly, and with the kindest feelings of good will, and only from necessity arising from inadequate compensations. As the National Government and local contributions have done so much to lay broad and deep the foundations of this enterprise, it is hoped that the State will not refuse that additional aid requisite to place it above the changes and injurious influence of an insufficient financial basis.

The Board cannot refrain from expressing not only their high appreciation of the untiring devotion and patient labors of the Faculty, and the willingness with which they have borne additional work devolved upon them by the requirements of the school and the smallness of the Board of Instruction, but also desire to express their approbation and appreciation of the services and energetic action of George M. Hagans, Esq., in superintending to successful completion the new University Hall, and of the cordial co-operation and support of the Executive Committee, as the immediate representative of the Board, and its judicious supervision of all the interests of the Institution.

Owing to the shortness of the sessions of the Board, and to ensure a fair and impartial examination of annual expenditures of the University, and the extra expenditures for the construction of the new Hall, a special committee consisting of three persons, without interest in the matter, and representing both political parties, was appointed to examine the reports, books, papers, vouchers, &c., of the Treasurer, Superintendent and Executive Committee, with instructions to report to your Excellency the condition of the same, and anything else deemed pertinent by them. Their report is herewith filed, and exhibits the financial affairs of the University in a very satisfactory condition.

The following very carefully prepared estimate of receipts and expenditures for the current year, is submitted with the statement that the estimate for contingent expenses of $1,500, includes advertising, printing catalogues, &c., postage, books and stationery for cadets, fuel and traveling expenses, &c., all of which have been reduced to the lowest possible amount:

ESTIMATED RECEIPTS.		
Interest from endowment of	$100,000	$ 6,000
Rent of boarding hall		400
Tuition fees		1,800
ESTIMATED EXPENDITURES.		
Salaries of Professors	$ 8,550	
Salaries of Superintendent, Janitor, Treasurer, Secretary, &c	1,000	
Contingent expenses	1,500	
Deficit		2,855
	$ 11,055	$ 11,055

Showing a deficit of $2,855, for which we respectfully ask the Legislature to make provision.

This estimate is made upon the present number of professors and present rate of compensation, and if the endowment appropriation heretofore asked for should be made, would not need to be increased.

The total cost of the improvements, including University Hall, repairs of College Hall, grading, magazine building and other repairs, amount to about $57,000, of which amount the State has appropriated only $35,000, the residue being the proceeds of the academy and lot, and money borrowed by the Executive Committee upon their individual responsibility, and loaned to the credit of the construction fund. The amount for which they have made themselves responsible is $5,950, and a small amount still due on contracts for the building will make the sum of $7,450, for which we ask the Legislature to make provision.

The amount borrowed by the members of the Executive Committee, who have discharged their duties without compensation of any sort, was imperatively required to carry on to successful completion University Hall, and to supply the necessary furniture, and with full faith that the State, which had begun the work in hand, and charged them with the responsibility of seeing it carried out, would reimburse them. No claim upon the public treasury can appeal more strongly to their justice.

With the full expectation that the same generous support that has heretofore been extended to this greatest interest of the State will continue to characterize legislative action, this report is respectfully submitted.

T. H. LOGAN,
President Board of Regents.

Morgantown, June 15, 1870.

PRESIDENT'S REPORT.

To Board of Regents of West Virginia University:

GENTLEMEN :—I congratulate you, at this, your third annual meeting, on the completion of our new and beautiful University Hall. Its well-arranged and commodious rooms for study, recitation, lecture, library, laboratory, society meetings, cabinets, &c., supply conveniences which had already become indispensable to the proper work of the Institution. While I refer you to the report of the Superintendent and the Executive Committee for an account of the details of its construction, I should say here that great credit is to be assigned not only to the architect who designed the building, but also to the contractors who executed the work, and especially to the superintendent, through whose careful oversight a building so thorough in its appointments and substantial in its construction, has been thus early completed.

During the past year the entire course of study from the first term of the preparatory to the last of the senior year, as published in the catalogue, has been taught. Looking up to God for His blessing on the gentleman who first leaves our halls as a regular graduate, we would pray that he may be the forerunner of a long line of alumni who shall be a blessing not only to our State and nation, but also to the world. I submit, with this, a copy of our catalogue (marked "A.") From it you will see that the growth of the University continues to be most gratifying. That where so many more liberally endowed enterprises of the kind have been comparative failures, our own institution, originated and sustained by National, State and individual bounty, notwithstanding the many and great disadvantages under which it has labored, still holds on its way, increasing in numbers, in resources, and in general prosperity, is certainly a source of the greatest thankfulness. This is owing no doubt, in part, to the fact that unembarrassed by long established, though it may be defective systems of organization, theories of culture, and lines of work, it has sought to follow the best precedents and to especially adapt itself to the spirit of the age and the immediate wants of the people for whose benefit it has been established. Though of such recent origin, it already offers facilities for educational training and culture surpassed by few in the States adjoining. In range and variety of instruction it is abreast, and indeed in advance of, some similar institutions whose origin dates one or two generations back; while the zeal, ability and thoroughness with which instruction has been imparted by the gentlemen you have appointed as professors, is alike creditable to themselves and the University. You will be gratified to observe that the one hundred and sixty-one students enrolled during the past year have been drawn from nine different States and Territories, and from twenty-six different counties in our own State. You will also notice that the regular college classes, in both the literary and scientific departments, are steadily increasing—amounting already to forty-three, which, with the large normal class of twenty-seven, makes an aggregate of seventy pupils in our more advanced classes. In regard to the normal class, it should be observed and understood that it is what it professes to be—a training class for teachers, under the care of a practical and thorough instructor, aided in turn by the several professors of the University, and so conducted as to best qualify those who enter it for still greater efficiency in their relation to the common and select schools of the State.

As the facilities and attractions of the University become more generally known; its full range of instruction; the low rates of tuition and general expenses; the health of its location, and the fertility and beauty of the region around; its accessibility, and yet comparative seclusion; its remarkable facilities for special branches of study, and the stability which its relation to the State and the nation secures; in proportion, and just as rapdily as these and other anticipated advantages become known, not only will its patronage and usefulness be increased, but a disposition on the part of individuals, as well as the State, by bequest and donation, to add to its various resources will be induced and manifested. To you, gentlemen, for the advantage of the State and of our common humanity, are, in large measure, entrusted the interests of this great enterprise. The favorable support it has so far received from the people is only an earnest of that larger favor which, as it increases in years, facilities and influence for good will yet be accorded to it. Be assured the people will sustain every measure with due consideration to conserve advantages already secured, and to still further strengthen and increase its means for the intellectual culture and moral improvement of the youth assembled in its halls. The American University seems to comprise as its leading idea, in the *first* place, a thorough and substantial college course. So began Harvard, Yale, and other of our older and better schools. This has been well provided for in our own institution. In the *second* place, such associated schools in Agriculture, Science, Military Tactics, Law, Medicine, Civil Engineering, &c., as seem most desirable, and as the means of the University will justify. A very respectable beginning has already been made with us in the direction of more than one of these. It is for you to consider how much farther they are to be enlarged. I wish especially to have the dignity and value of the Agricultural, Scientific and Military Schools enhanced so that the final honors, which are to be the same, may represent as nearly as possible the same amount of discipline and attainment. It is also to be hoped the time is not far distant when the way may be open to secure the commencement of schools of Law and Medicine, more or less intimately connected with the University. It is possible this may be done, at the beginning at least, with but little additional cost. The Professor of Languages has, with the aid of the other professors, labored assiduously to carry out the curriculum of instruction in both the ancient and modern tongues. The demand in this direction has become too great for any one man adequately to supply. I recommend that as soon as possible the chair of languages be divided into two professorships—one of the ancient languages and literature; the other of the modern languages and literature.

I respectfully call attention to the accompanying report (marked "C,") from the Commandant of the State Cadets and Professor of Mathematics and Military Tactics. The accomplishments of Captain Pierce as a scholar, teacher and officer, and his earnest devotion to the duties assigned him, unite in giving to his recommendations a claim upon your consideration. In the difficult and delicate task of harmonizing the military with the other departments, and of securing the appropriate ends of its discipline, we have hitherto depended mainly upon moral restraints rather than military government, and with results so favorable as to be the subject of wide spread remark and commendation, should stricter and more formal military discipline be thought desirable. Captain Pierce is prepared to submit a code of rules and regulations for that end. I especially call your attention to his remarks about the necessity of an armory, having, in all earnestness, in former reports, directed attention to the same subject. I would also respectfully submit a Report from the Professor of Chemistry and Natural History, marked ("D.") In this, Dr. Stevenson proposes to dispose of his cabinet to the University. The collection comprises 650 species of fossils, represented by some 1,500 specimens; also, a collection of minerals, &c. I submit a classified catalogue of the same, (marked "D--a.") The whole may be seen arranged in the case and on the shelves of the museum. With the additions he may be able to secure and has engaged to make, it will serve as the foundation of an excellent working cabinet for the purposes of the institution. And I trust it may be in your power to avail yourselves of his offer. At my request, Dr. Stevenson has, as he could find time, been giving attention to the geology, and mineral and other resources of the State. The results of a part of his observations and studies have been embodied in a paper accompanying this, (marked "B,") mainly upon the county in which the University is located, and which, as opportunity arises, may be continued and extended to other counties and sections of the State, unless, as is greatly to be desired, the Legislature should, in the meantime, order and provide for a more formal survey.

The low compensation allowed the professors, and the temptations of higher salaries elsewhere, have already lost us some of the best men who have been called by you to the service of the University. If this continues, there is reason to fear the loss of others whom we can ill afford to spare. The very success of the institution has tended to throw more than usual work upon them, and with great diligence and faithfulness they have endeavored to meet the demand. Even should others, equally able, be found willing to take the place of those who go where their services are better appreciated and rewarded, the fact that about as soon as the students become attached to a teacher he is withdrawn from them, and that the methods of instruction, approved and successfully pursued by him, are either wholly rejected or indifferently carried out by his successor, and that changes from such causes tend greatly to fret and discourage students, would, if there were no higher considerations, tend to show the propriety of removing the cause of such changes. I will not enlarge upon the blighting effects of frequent change in the Board of Instruction, but will express the hope that the way may be open for you to remove the only cause assigned for their occurrence here.

Respectfully submitted,

ALEX. MARTIN,
President W. Va. University.

"A"

CATALOGUE

OF THE

OFFICERS AND STUDENTS

IN

West Virginia University,

WITH THE

COURSES OF INSTRUCTION

AND

A GENERAL DESCRIPTION OF THE INSTITUTION.

1869-70.

MORGANTOWN:

1870.

Board of Regents.

No. of Dist.	Member of Board.	P. O. Address.
1.	T. H. LOGAN,	*Wheeling.*
2.	Hon. F. H. PEIRPOINT,	*Fairmont.*
3.	GEORGE M. HAGANS,	*Morgantown.*
4.	SAMUEL BILLINGSLEY,	*Middlebourne.*
5.	Hon. A. I. BOREMAN,	*Parkersburg.*
6.	J. LOOMIS GOULD,	*Buckhannon.*
7.	W. W. HARPER,	*Point Pleasant.*
8.	J. S. WILKINSON,	*Hamlin.*
9.	SAMUEL YOUNG,	*Edray.*
10.	JAMES CARSKADON,	*New Creek.*
11.	G. M. BELTZHOOVER,	*Shepherdstown.*

Officers of the Board.

—————— ——————, *President.*
Col. JAMES EVANS, *Treasurer.*
GEORGE C. STURGISS, *Secretary.*

Executive Committee.

GEO. M. HAGANS, *Chairman.*
Hon. JOHN A. DILLE.
E. H. COOMBS,
ASHBEL FAIRCHILD,
GEORGE C. STURGISS,
ALEXANDER MARTIN.

Faculty and Teachers.

REV. ALEX. MARTIN, D.D., *President,*

And Professor of Mental and Moral Science.

F. S. LYON, A.M., *Vice President,*

Professor of English Literature, and Principal of Preparatory Department.

S. G. STEVENS, A.M., *Secretary,*

And Professor of Astronomy and Physics.

H. H. PIERCE, A.M., BVT. CAPT. U. S. A.

Professor of Mathematics and Military Tactics.

J. J. STEVENSON, A.M., PH. D.,

Professor of Chemistry and Natural History.

F. W. WOOD, A.M., PH. D.,

Professor of Ancient and Modern Languages.

O. W. MILLER, A.M.,

Tutor.

D. B. PURINTON,

Tutor in the Preparatory Department..

GEORGE M. HAGANS, ESQ.,

Superintendent of Grounds and Buildings.

HUGH W. BROCK, M.D.,

Lecturer on Physiology and Hygiene.

HON. JOHN A. DILLE,

Lecturer on Civil and Constitutional Law.

CAPT. H. H. PIERCE, A.M.,

Registrar and Librarian.

A. G. ALCOTT.

Teacher of Elocution.

Students.

Senior Class.

Dent, Marmaduke Herbert,	Weston, Lewis County.

Junior Class.

Jolliff, William Elza,	White Day,	Monongalia	Co.
Snider, Elisha,	Easton,	"	"
Wilson, Thomas Campbell,	Morgantown,	"	"

For the Degree of Bachelor of Science.

Dille, Oliver Hagans,	Morgantown, Monongalia Co.

Sophomore Class.

Border, Daniel Webster,	Frederick City, Maryland.
Drabell, John Herschell,	Morgantown.
M'Lane, Alan Elza,	"
Smith, Benjamin Wells,	Ripley, Tyler Co.

Freshmen Class.

Adams, John Christian,	Wheeling, W. Va.
Babb, Charles Montgomery,	Locust Grove, Grant Co.
Bowman, William Thorne,	Morgantown.
Bullock, Edmund Tanner,	Parkersburg, W. Va.
Carter, Eldridge,	Meredith's Tavern, Marion Co.
Fast, Jonathan Wesley,	Forksburg.
Ledwith, William Laurence,	Brownsville, Pa.
Purinton, Aaron Lyon,	Morgantown.
Smith, Clarence Linden,	Fairmont, Marion Co.
Temple, Marcellus Luther,	Wadestown, Monongalia Co.
White, Israel,	Jollytown, Greene Co., Pa.

For the Degree of Bachelor of Science.

Carper, Wirt Dale,	Romine's Mills, Harrison Co.
Chadwick, Richard Vincent,	Morgantown.
Dunkin, James,	Bridgeport, Harrison Co.
Golden, Franklin Augustus,	Wayne Court House.
Harding, Noland Bruce.	Bruceton, Preston Co.
Haymond, Lewis,	Clarksburg, Harrison Co.
Hoffman, Daniel Clarke,	Morgantown.
List, Ambrose Shaw,	Wheeling.
Mattingly, George Perry,	Parkersburg, Wood Co.
McClure, Taylor Bascom,	Louisa, Lawrence Co., Ky.
Osgood, George Kendall,	Ceredo, Wayne Co.
Rader, Archibald Fleming,	Summersville, Nicholas Co,
Woods, Jacob Sherman Shriver,	Wheeling.

University Students.

Anderson, John Coombs,	Easton, Monohgalia Co.
Edmiston, Theodoric Granville,	Weston, Lewis Co.
Forman, Charles,	Bruceton, Preston Co.
Hall, John Durbin,	Morgantown.
Harris, John Thomas,	Harrisville, Ritchie Co.
Hewitt, Christian,	Linton, Jefferson Co., Ohio.
John, Altha Franklin,	Stewarttown, Monongalia Co.
Lazzell, Thomas Allen,	Morgantown.
McKee, Henry Franklin,	Brandonville, Preston Co.
Pitzer, William Anthony,	Martinsburg, Berkeley Co.

Preparatory Department.

Adams, Samuel Shugart,	Washington, D. C.
Allen, William Stone,	Uniontown, Fayette Co., Pa.
Allen, Charles Barton,	Uniontown, Fayette Co., Pa.
Allen, Guy Richards Chamlpine,	Morgantown, W. Va.
Allender, Joseph Shuttlesworth,	Morgantown, W. Va.
Arnett, Franklin,	Hoodsville, Marion Co.
Arnett, William Jerome,	Arnettsville, Monongalia Co.
Bailey, Charles Edwin,	Wheeling, W. Va.
Basnett, Ferdinand Samuel,	Morgantown.
Beatty, Richard Henry,	East Liberty.
Berkeley, Cincinnatus,	Middlebourne, Tyler Co.
Bettler, Joseph,	Brownsville, Pa.
Birtcher, Calvin Luther,	Randall, Monongalia Co.
Boughner, William Leroy,	Morgantown.
Bowers, John Henry,	Laurel Iron Works, Mon'galia.
Bowman, John Wesley Shaw,	New Interest, Randolph Co.
Boyer, Ami,	Brandonville, Preston Co.
Boyers, William Thomas,	Randall, Monongalia Co.
Boyers, James,	Randall, Monongalia Co.
Brandt, John Bunyan,	Oakland, Allegany Co., Md.
Brookover, Josephus,	West Warren, Monongalia Co.
Brown, William,	Andy, Monongalia Co.
Brown, Robert Ludington,	Morgantown.
Brown, William Gay,	Kingwood, Preston Co.
Butler, Alexander,	Kearneysville, Jefferson Co.
Caldwell, Joseph Bailey,	Wheeling, W. Va.
Carskadon, George Thomas,	New Creek, Mineral Co.
Casteel, Truman Whitfield,	Oakland, Allegany Co., Md.
Chadwick, Jeremiah Thompson,	Springfield, Hampshire Co.
Christie, Samuel Elgar,	Kanawha Salines, Kanawha.
Coleman, Elijah Chalfant,	Morgantown.
Cox, James Alfred,	Arnettsville, Monongalia Co.
Darlinton, John William,	Weston, Lewis Co.
Dean, George Albert,	Wheeling, W. Va.
Deen, John Shreve William,	Buckhannon, Upshur Co.
Denison, Lewis Augustus,	East Liberty, Pa.
Dix, Daniel Worth,	Nicholas Court House.

Dolliver, Jonathan Prentiss.	Granville, Monongalia Co.
Dolliver, Robert.	Granville, Monongalia Co.
Duval, Walter Kuhn.	Wellsburg, Brooke Co.
Etchison, William Peaco.	Ft. Laramie, Dacotah Terr.
Everly, Simeon Oliver.	Morgantown.
Fast, Morgan Selby.	Forksburg, Marion Co.
Fischer, Ferdinand.	Lanesville, Harrison Co., Ind.
Gorrill, Moses.	Wick, Tyler Co.
Hagans, George Harrison.	Morgantown.
Hagans, William Lucian.	Morgantown.
Haymond, Frank Thompson.	Morgantown.
Hickman, Charles Frank.	St. Mary's, Pleasants Co.
Hill, George Bruce.	Laurel Iron W'ks, Monongalia
Hill, William Clay.	Paris, Washington Co., Pa.
Hillory, William Sanford.	Wadestown, Monongalia Co.
Holyfield, Clark.	Easton, Monongalia Co.
Hooper, Harry.	Grafton, Taylor Co.
Howell, William Moses.	Morgantown.
Jacobs, Thomas Perry.	Morgantown.
Jackson, Duncan Campbell.	Brownsville, Pa.
Jolliff, Joseph Clinton.	Whiteday, Monongalia Co.
Keck, Julius Marcellus.	Morgantown.
Kincaid, William Elza.	Forksburg, Marion Co.
Kincaid, George Washington.	Morgantown.
Kincaid, John Wesley.	Morgantown.
Kitzmiller, George Washington,	Altamont, Allegany Co., Md.
Knox, Philander Chase.	Brownsville, Pa.
Koontz, Winfield Scott.	Easton, Monongalia Co.
Koontz, Albert.	Easton, Monongalia Co.
Lazier, Andrew Forman.	Morgantown.
Licklider, Thomas Powell.	Kearneysville, Jefferson Co.
Linch, George Preston.	Wheeling.
List, Thomas Eugene.	Wheeling.
Logie, John Harry,	Kearneysville, Harrison Co.
Lynch, Charles Wesley.	Brown's Creek, Harrison Co.
Martin, James Virginius.	Morgantown.
Martin, John Errian.	Morgantown.
Martin, Charles Alexander.	Morgantown.
Mattingly, Thomas Conley.	Parkersburg, Wood Co.
Merrill, Joseph Morgan.	Rivesville, Marion Co.
Mitchell, William David.	Hancock, Washingt'n Co., Md.
Moran, Ellsworth Elza.	Forksburg, Marion Co.
Morgan, Benjamin Stephen.	Laurel Point, Monongalia Co.
McColloch, Abram Inskipt.	Clinton, Ohio Co.
McKee, Robert Jackson.	Wadestown, Monongalia Co.

McLure, Harry.	Wheeling.
McRa, Waitman.	Clinton Mills, Monongalia Co,
Pogue, Robert Henry.	Wheeling.
Pratt, Edgar Woods.	Wheeling.
Price, Thomas Harner.	Mooresville, Monongalia Co.
Reed, James Madison.	Morgantown.
Rich, Daniel.	Laurel Point, Monongalia Co.
Rider, George Winfield.	Morgantown.
Robinson, Eustace Leon.	Morgantown.
Rogers, William.	Morgantown.
Roraback, John Zebulon.	Albion, Orleans Co., N. Y.
Samples, James William.	Clintonville, Greenbrier Co.
Santee, Isaac Benton.	West Warren, Monongalia Co.
Schaeffer, Gustavus Cresap.	Kingwood, Preston Co.
Seibert, William Valliant.	Hainesville, Berkeley Co.
Shriver, Lot Lantz.	Wadestown, Monongalia Co.
Simmons, David Floyd.	Weston, Lewis Co.
Sisson, George Edward,	Valley Grove, Ohio Co.
Smith, Winfield William.	Bruceton, Preston Co.
Spates, Augustus Baer.	Clarksburg, Harrison Co.
Sterling, Andrew Jackson.	Masontown, Fayette Co., Pa.
Steuart, Aaron Cromwell.	North Mountain, Berkeley Co.
Steuart, John William.	Sycamore Dale, Harrison Co.
Stewart, Cassius Milton.	Wheeling.
Stockman, Frederick.	North Mountain, Berkeley Co.
Strickler, Robert Mann.	Phillippi, Barbour Co.
Tarr, Hammond.	Wellsburg, Brooke Co.
Teter, William Jay Worth.	Belington, Barbour Co.
Thrasher, William Marshall.	Piedmont, Mineral Co.
Wagner, Allen Kramer.	Morgantown,
Warman, Clemmer.	Laurel Iron W'rks, Mon'ng'lia
Warman, Elza.	Laurel Iron W'rks, Mon'ng'lia
Williams, Daniel Theodore.	New Martinsville, Wetzel Co.
Woods, Frank.	Phillippi, Barbour Co.
Worley, David Robert.	Blacksville, Monongalia Co.
Wright, Palemon.	Durbannah, Monongalia Co.

Military Department.

Bvt. Capt. H .H. PIERCE, U. S. A., *Commandant.*

Staff.

Cadet MARMADUKE H. DENT, *Adjutant.*
" C. LINDEN SMITH, *Ord. Officer.*
" FRANKLIN A. GOLDEN, *Ass't Ord. Officer.*

OFFICERS—Corps of Cadets.

Cadet JOHN C. ADAMS, *Captain.*
" JOHN H. DRABELL, *First Lieut.*
" BENJAMIN W. SMITH, *Second Lieut.*

Corps of Cadets.

John C. Adams	1st District.
J. S. Shriver Woods	" "
Israel C. White	2d District.
Ellsworth E. Moran	" "
William T. Bowman	3d District.
Marcellus L. Temple	" "
Benjamin W. Smith	4th District.
John S. W. Dean	" "
——— ———	5th District.
——— ———	" "
John H. Drabell	6th District.
Marmaduke H. Dent	" "
Daniel W. Dix	7th District.
——— ———	" "
George K. Osgood	8th District.
Franklin A. Golden	" "
William M. Howell	9th District.
Archibald F. Rader	" "
Charles M. Babb	10th District.
Clarence L. Smith	" "
Daniel W. Border	11th District.
——— ———	" "

OFFICERS—Volunteer Corps.

THOMAS C. WILSON, *Captain.*
WILLIAM E. JOLLIFF, *First Lieut.*
ALAN E. M'LANE, *Second Lieut.*

Volunteer Labor Corps.

Samuel S. Adams,
Charles M. Babb,
Cincinnatus Berkeley,
Daniel W. Border,
Ami Boyer,
John B. Brandt,
Robert L. Brown,
William G. Brown,
Alexander Butler,
George T. Carskadon,
Jeremiah T. Chadwick,
Samuel E. Christie,
Elijah C. Coleman,
John W. Darlinton,
John S. W. Dean,
Marmaduke H. Dent,
Daniel W. Dix,
T. G. Edmiston,
Morgan S. Fast,
Ferdinand Fischer,
F. A. Golden,
N. Bruce Harding,
John T. Harris,
Lewis Haymond,
George B. Hill,
Clark Holyfield,
William M. Howell,
William L. Ledwith,
Thomas P. Licklider,
George P. Linch,
John H. Logie,
George P. Mattingly,
Thomas H. Mattingly,
Joseph M. Merrill,
E. E. Moran,
Taylor B. McClure,
H. Franklin McKee,
Harry McLure,
George K. Osgood,
A. F. Rader,
Daniel Rich,
John Z. Roraback,
Benjamin W. Smith,
C. L. Smith,
M. L. Temple,
Clemmer Warman,
Elza Warman,
Israel White,
Daniel T. Williams,
J. S. Shriver Woods,
Palemon Wright.

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Normal Class.

Franklin Arnett,
Calvin L. Birtcher,
Ami Boyer,
Josephus Brookover,
William Brown,
Elijah C. Coleman,
John S. W. Dean,
Simeon O. Everly,
Morgan S. Fast,
George B. Hill,
Clark Holyfield,
William M. Howell,
William E. Kincaid,
George W. Kincaid,
Charles W. Lynch,
Ellsworth E. Moran,
Benjamin S. Morgan,
Aaron L. Purinton,
Daniel Rich,
Eustace L. Robinson,
James W. Samples,
Isaac B. Santee,
Marcellus L. Temple,
Clemmer Warman,
Elza Warman,
Israel White,
Daniel T. Williams.

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Recapitulation.

Senior	1
Junior	4
Sophomore	4
Freshmen	34
Normal Class, 27, (less 3 previously enumerated,)	24
Preparatory Department	94
Total	161

Requisites for Admission.

I. All candidates for admission to any Department of the University, must present satisfactory evidence of good moral character.

II. Students coming from other Colleges must produce certificates of honorable dismission from the same.

III. Those entering as students for a Degree in any Department of the University, must sustain an examination in the various studies of the Preparatory School of the University, or a full equivalent to the same.

IV. Candidates for advanced standing must sustain an examination in the previous studies of the Department which they propose to enter.

V. The regular examination for admission of candidates, who shall not have pursued their preliminary studies in the Preparatory School of the University, will take place on Thursday (June 16) succeeding Commencement, and on Tuesday (September 7) preceding the opening of the Fall term.

VI. Candidates should procure a copy of the printed laws of the University, also the Treasurer's receipt for their tuition fee, before presenting themselves for enrolment.

Courses of Instruction.

The instruction thus far provided for in the University proper, is principally embraced in four departments or courses of study, viz.: Classical Department, Scientific Department, Engineering Department and Agricultural Department.

CLASSICAL DEPARTMENT.

This Department, leading to the Degree of Artium Baccalaureus, embraces studies in eight schools as follows:

I. School of Philosophy.

Professor in charge—PRESIDENT MARTIN.

In this School the instruction is given partly by the use of text books and partly by lectures. The Classical Course includes six terms in this school.

FIRST YEAR.

SPRING TERM.—*Political Philosophy*—Bowen's Political Economy.
FALL TERM.—*Mental Philosophy*—Haven's.
WINTER TERM.—*Moral Philosophy.*—Wayland's.

SECOND YEAR.

FALL TERM.—*Political Philosophy.*—International Law.—Woolsey.
WINTER TERM.—*Sacred Philosophy*—Butler's Analogy.
SPRING TERM.—*Sacred Philosophy.*—Natural Theology and Ev. Christianity.

II. School of History and English Literature.

PROFESSOR LYON.

Besides Themes, Declamations and Rhetorical Readings throughout the course, this School embraces six terms, equivalent to two years of instruction by text books.

FRESHMAN YEAR.

FALL TERM.—Universal History—Webber's.
WINTER TERM.—English Literature—Shaw's Manual.

SOPHOMORE YEAR.

Fall Term.—Rhetoric—Whateley's Elements.
Winter Term.—Logic—Coppee's.

JUNIOR YEAR.

Spring Term.—History of Civilization—Guizot's.

SENIOR YEAR.

Spring Term.—Literary Criticism—Lord Kames'.

III. School of Astronomy and Physics.

Professor Stevens.

This School furnishes studies in the Classical Course extending through two years.

JUNIOR YEAR.

Fall Term.—*Physics*—Silliman's. to Chap. IV, including problems.
Winter Term.— " Pneumatics, Acoustics, Optics.
Spring Term.—Heat, Correlation of Forces, Electricity.

SENIOR YEAR.

Fall Term.—Physics—Analytical Mechanics.
Winter Term.—Astronomy—Robinson's, Descriptive and Physical.
Spring Term.—Practical Astronomy.

The various branches of Physics are illustrated by means of suitable apparatus. In Astronomy the treatment in the text book is supplemented by lectures, whenever it is required, in order to represent fairly the present state of astronomical knowledge.

IV. School of Mathematics and Engineering.

Professor Pierce.

The studies in the Classical Department in this School extend through two years.

FRESHMAN YEAR.

Fall Term.—*Mathematics*—Robinson's New University Algebra.
Winter Term.— " Robinson's Geometry, commencing at Book VI.
Spring Term.— " Robinson's Spherical Geometry and Trigonometry.

SOPHOMORE YEAR.

Fall Term.—*Engineering*—Mensuration, Surveying and Navigation.
Winter Term.—*Mathematics*—Conic Sections and Analytical Geometry.

JUNIOR YEAR.

SPRING TERM.—*Mathematics*—Differential and Integral Calculus.

V. School of Chemistry and Natural History.

PROFESSOR STEVENSON.

FRESHMAN YEAR.

SPRING TERM,—Anatomy and Physiology—Draper's.

SOPHOMORE YEAR.

FALL TERM.—Inorganic Chemistry—Roscoe's.
WINTER " Organic Chemistry— "
SPRING " Botany—Gray's School and Field Book.

JUNIOR YEAR.

WINTER TERM.—Zoölogy—Agassiz and Gould.

SENIOR YEAR.

FALL TERM.—Geology—Dana.

VI. School of the Greek Language and Literature.

PROFESSOR WOOD.

FRESHMAN YEAR.

FALL TERM.—Herodotus; Arnold's Greek Prose Composition.
WINTER " Homer's Iliad; Arnold (continued); Greek Grammar.
SPRING " Homer's Odyssey; Arnold's Prose Comp. (completed.)

SOPHOMORE YEAR.

FALL TERM.—Xenophon's Memorabilia; *Exercises* in Greek Composition.
SPRING " Plato's Apology and Crito.

JUNIOR YEAR.

FALL TERM.—Euripides' Alcestis.
SPRING " Demosthenes on the Crown.

SENIOR YEAR.

WINTER TERM.—Sophocles—Oedipus Tyrannus.

VII. School of the Latin Language and Literature.

PROFESSOR WOOD.

FRESHMAN YEAR.

FALL TERM.—Virgil—Bucolics and Georgics; Arnold's Latin Prose Composition.
WINTER " Horace—Odes and Epodes; Arnold (continued.)
SPRING " Cicero—De Senectute or De Amicitia.

SOPHOMORE YEAR.

WINTER TERM.—Horace— Satires and Epistles; Exercises in Latin Composition.
SPRING " Livy—Lincoln's; Exercises in Latin Composition.

JUNIOR YEAR.

WINTER TERM.—Tacitus—Germania and Agricola; Latin Composition (continued.)

SENIOR YEAR.

FALL TERM.—Cicero—De Officiis; Written Exercises on Historical Subjects.

VIII. School of Military Science and Tactics.

PROFESSOR PIERCE.

FIRST YEAR.

FIRST TERM.—*Infantry Tactics*—School of the Soldier.
SECOND " *Cavalry Tactics*—Sabre Drill—Lectures.
THIRD " *Artillery Tactics*—School of the Piece.

SECOND YEAR.

FIRST TERM—*Infantry Tactics*—School of the Company.
SECOND " *Bayonet Exercise;* Lectures.
THIRD " *Target Practice*—Small Arms.

THIRD YEAR.

FIRST TERM.—*Infantry Tactics*—School of the Battalion.
SECOND " *Military Engineering*—Lectures.
THIRD " *Target Practice*—Heavy and Field Artillery.

FOURTH YEAR.

FIRST TERM—*Infantry Tactics*—School of the Brigade.
SECOND " *Science of Gunnery*—Lectures; *Martial Law*—Lectures.
THIRD " *Art of War*—Lectures.

Dress Parades, Reviews, Inspections and Guard Mounting are held as often as is deemed expedient throughout the whole course.

SCIENTIFIC DEPARTMENT.

This Department, leading to the degree of Bachelor of Science, embraces studies in seven schools, as follows:

I. In the School of Philosophy.

Professor in Charge—PRESIDENT MARTIN.

SENIOR YEAR.

FALL TERM.—*Mental Philosophy*—Haven's.
WINTER " *Moral Philosophy*—Wayland's.
SPRING " *Political Economy*—Bowen's.

II. In the School of History and English Literature.

PROFESSOR LYON.

FRESHMAN YEAR.

Fall Term—Webber's Universal History.
Winter " Shaw's Manual of English Literature.
Spring " Guizot's History of Civilization.

Senior Year.

Fall Term—Whately's Elements of Rhetoric.
Winter " Coppee's Logic.

III. School of Astronomy and Physics.

PROFESSOR STEVENS.

Junior Year.

First Term.—General Principles of Physics; Gravitation; Theory of Machinery; Molecular Forces; Hydrodynamics; Problems.
Second " Pneumatics; Acoustics; Optics; Problems.
Third " Heat; Ventilation and Warming; Correlation of Physical Forces; Magnetic, Statical and Dynamical Electricity.

Senior Year.

First Term.—Analytical Mechanics.
Second " Astronomy—Descriptive and Physical—Robinson's.
Third " 1st. Practical Astronomy, Calculation and Graphical Construction of Eclipses; Solution of Problems to be verified by the Nautical Almanac.
2d. Technology—Principles of Science applied to the Useful Arts.

To pursue successfully the studies of the First Year of this School, students must have a fair acquaintance with Algebra, Geometry and Trigonometry, and in addition to these, he should have, before commencing those of the second year, some knowledge of Analytical Geometry and Calculus.

IV. In the School of Mathematics and Engineering.

PROFESSOR PIERCE.

Freshman Year.

First Term.—Robinson's University Algebra.

Second “ Robinson's Geometry, beginning at Book VI.

Third “ “ Spherical Geometry and Trigonometry.

Junior Year.

First Term.—Robinson's Mensuration, Surveying and Navigation

Second “ “ Analytical Geometry and Conic Sections,

Third “ Differential and Integral Calculus.

V. School of Chemistry and Natural History.

PROFESSOR STEVENSON.

Freshman Year.

Fall Term.—Roscoe's Chemistry. (Inorganic.)

Winter “ “ “ (Organic.)

Spring “ Gray's School and Field Book of Botany.

Junior Year.

Fall Term.—Agricultural Chemistry—Analysis of Soils, &c.

Winter “ Comparative Physiology and Embryology—Agassiz and Gould.

Spring “ Human Anatomy and Physiology—Draper's.

Senior Year.

Fall Term.—Lithological, Dynamical and Historical Geology—Dana.

VI. School of Modern Languages.

PROFESSOR WOOD.

Freshman Year.

Fall Term.-German—Woodbury's New Method; Oral and Written Exercises.

Winter “ German—Woodbury's Method, completed; Adler's Reader.

Spring German—Selected Poetry of Goethe; Heyse's advanced Grammar, and his view of German Literature.

Junior Year.

Fall Term.—French—Fasquelle's French Course; Oral and Written Exercises.

Winter “ French—Fasquelle completed.

Spring “ French—Telemachus or Dumas' Napoleon; Memorizing Sentences and Conversation.

VII. School of Military Science and Tactics.

PROFESSOR PIERCE.

The studies in this School are the same as those of the Classical Department. They are enumerated on page 18.

DEPARTMENT OF ENGINEERING.

The studies in this Department, for the first and second years, are the same as in the General Scientific Course. For the senior year they are, in

School of Philosophy.

PRESIDENT MARTIN.

Fall Term—Haven's Mental Philosophy.
Spring " Bowen's American Political Economy.

School of History and English Literature.

PROFESSOR LYON.

Winter Term—Coppee's Logic.

School of Astronomy and Physics.

PROFESSOR STEVENS.

Fall Term—Peck's Elements of Mechanics; Application of Calculus to Mechanics.
Winter Term—Robinson's University Astronomy; Lectures.
Spring " Practical Astronomy—Calculation of the Elements of Eclipses from the Solar and Lunar Tables. Graphical Construction of Eclipses. Conputation of particulars of a general Eclipse Trigonometrically, and of a Local Eclipse by the application of Analytical Geometry.

School of Mathematics and Engineering.

PROFESSOR PIERCE.

Fall Term—Civil Engineering—Mahan.
Winter " Military Engineering—Mahan.
Spring " Gillespie on the Location, Construction and Improvement of Roads and Railroads.

School of Chemistry and Natural History.

Fall Term—Geology—Lithological, Historical and Dynamical—Dana; Geological Excursions.

AGRICULTURAL DEPARTMENT.

In this Department, the studies for the first and second years are the same as in the General Scientific Course, excepting that for Modern Languages are substituted Lectures on various subjects related to Agriculture; for the Analytical Geometry of the second term, Logic, and for the Calculus in the third term, Political Economy. For the senior year, they include the following:

School of Philosophy.

PRESIDENT MARTIN.

Fall Term—Haven's Mental Philosophy.
Winter " Wayland's Moral Philosophy.
Spring " Natural Theology and Evidences of Christianity.

School of Astronomy and Physics.

PROFESSOR STEVENS.

Fall Term—Principles of Agriculture—Emerson and Flint.
Winter " Theoretical Astronomy.
Spring " Technology—Application of the Principles of Science to the Useful Arts.

School of Mathematics and Engineering.

PROFESSOR PIERCE.

Spring Term—Location and Construction of Roads—Gillespie.

School of Chemistry and Natural History.

PROFESSOR STEVENSON.

Fall Term—Dana's Text Book of Geology.
Winter " Meteorology.

The subjects for Lectures during the course are the following:

FIRST YEAR.

Fall Term—The Chemistry, Structure and Physiology of Plants; on the Water, Atmosphere and Soil as related to Vegetables; on Tillage, Draining and Manuring.

Winter Term—On Domestic Animals and their Digestion, Respiration, Assimilation and Excretion; on the Composition, Preparation and Value of different kinds of Food; on Milk, Butter, Cheese, Flesh and Wool as Agricultural Products.

Spring Term—On Horticultural and Kitchen Gardening; on the Propagation, Training and Culture of Fruit Trees, the Vine, Small Fruits and Vegetables.

SECOND YEAR.

Fall Term—On the staple grain, forage, root and fibre crops of this and adjoining States, and their varieties and the soils best adapted for them; on the preparation of soil, seeding, cultivating, harvesting and preparing for market; on the Origin and Natural History of Domestic Animals; on Entomology and the Insects useful and hurtful to vegetation.

Winter Term—On the raising, care, characteristics and adaptation of different breeds of Domestic Animals; on Cattle for beef or draught, and Sheep for wool or mutton; on Horses, Swine and Poultry; on Pasturing, Soiling and Stall Feeding; on Tobacco, Hops and Forestry.

Spring Term—On Rural Economy; on the History of Agriculture, with sketches of the same in ancient and modern times and foreign lands; on the Adaptation of Farming to soil, climate, market and other natural and economical conditions; on the different systems of Husbandry, such as stock, sheep, grain and mixed farming.

PREPARATORY DEPARTMENT.

FIRST YEAR.

Fall Term—Geography—Guyot's Common School; Map Drawing; Arithmetic—Stoddard's Complete; English Grammar—Etymology; Latin—Commenced.

Winter Term—Geography—Guyot Continued; Map Drawing; Arithmetic—Continued; English Grammar—Syntax; Latin—Grammar and Reader.

Spring Term—Arithmetic—Completed; English Grammar—Analysis of Sentences; Latin—Grammar and Reader; Greek—Bullions' First Lessons.

SECOND YEAR.

Fall Term—Algebra—Robinson's New Elementary, to Involution; Book Keeping; Cæsar—Latin Grammar; Greek Grammar and Reader.

Winter Term—Algebra—Elementary completed; History of the United States—Wilson's; Cicero's Orations—Bullion's; Latin Grammar; Greek Grammar and Reader.

Spring Term—Geometry—Robinson's First Five Books; History of the United States—Completed; Virgil—Three Books of Æneid; Latin Grammar; Xenophon's Anabasis; Greek Grammar.

Regular lessons in Writing, Spelling, Elocution and English Composition from the beginning.

GENERAL REVIEW OF THE

		CLASSICAL DEPARTMENT.	SCIENTIFIC DEPARTMENT.
FRESHMAN CLASS.	FALL TERM.	Universal History. University Algebra. Herodotus. Virgil.	Universal History. University Algebra. Inorganic Chemistry. Woodbury's German Method.
	WINTER TERM.	Manual of English Literature. Geometry—completed. Homer—*Iliad.* Horace—Odes and Epodes.	Manual of English Literature. Geometry—completed. Organic Chemistry. Woodbury's German Method.
	SPRING TERM.	Trigonometry. Anatomy and Physiology. Homer—Odyssey. Cicero—*De Senectute.*	Trigonometry. Botany. History of Civilization. German—*Translations.*
SOPHOMORE CLASS.	FALL TERM.	Whately's Rhetoric. Mensuration, Surveying. Roscoe's Chemistry—*Inorganic.* Xenophon's Memorabilia.	
	WINTER TERM.	Logic. Con. Sect. and Anal. Geometry. Roscoe's Chemistry. Horace—*Satires and Epistles.*	
	SPRING TERM.	American Political Economy. Gray's Botany. Plato—*Apology and Crito:* Livy.	
JUNIOR CLASS.	FALL TERM.	Haven's Mental Philosophy. Constitution U. S. and West Va. Physics—commenced. Euripedes—Alcestis.	Mensuration; Surveying. Physics—commenced. Qualitative Analysis. Fasquelle's French Course.
	WINTER TERM.	Wayland's Moral Science. Pneumatics; Acoustics; Optics. Principles of Zoology. Tacitus—*Germania and Agricola.*	Conic Sect. and Anal. Geometry. Pneumatics; Acoustics; Optics. Principles of Zoology. *French*—Fasquelle continued.
	SPRING TERM.	Calculus. Heat; Electricity. History of Civilization. Demosthenes—*On the Crown.*	Diff. and Integral Calculus. Heat; Electricity. Anatomy and Physiology. *French*—Dumas' Napoleon.
SENIOR CLASS.	FALL TERM.	Woolsey's International Law. Peck's Mechanics, Dana's Text Book of Geology. Cicero—*De Officiis.*	Haven's Mental Philosophy. Peck's Mechanics. Dana's Geology. Whately's Rhetoric.
	WINTER TERM.	Butler's Analogy. Theoretical Analogy. Sophocles—Œdipus Tyrannus.	Moral Philosophy. Descriptive and Physical Astronomy. Logic.
	SPRING TERM.	Nat. Theology and Ev. Christianity. Kames' Elements of Criticism. Practical Astronomy.	Political Economy. Elements of Criticism. Practical Astronomy.

COURSES OF INSTRUCTION.

ENGINEERING DEPARTMENT.	AGRICULTURAL DEPARTMENT.
Same as in General Scientific Department.	Universal History. University Algebra. Inorganic Chemistry. Lectures on Plants, Soils, &c.
Same as in General Scientific Department.	Manual of English Literature. Plane Geometry—completed. Inorganic Chemistry. Lectures on Domestic Animals, &c.
Same as in General Scientific Department.	Spher. Geometry and Trigonometry. School and Field Book of Botany. History of Cizilization. Lectures on Horticulture.
Same as in General Scientific Department.	Mensuration and Surveyinng, *Physics*—Theory of Machinery, &c. Agricul'l Chemistry; Analysis of Soils. Lectures on Crops and Hurtful Insects.
Same as in General Scientific Department.	Logic. *Physics*—Pneumatics & Undulations. Comparative Physiology. Lectures on Cattle, Sheep, Horses, &c,
Same as in General Scientific Department.	Political Economy. Heat; Electricity; Magnetism. Human Anatomy and Physiology. Lectures on Agriculture.
Mental Philosophy. Analytical Mechanics. Dana's Geology. Mahan's Civil Engineering.	Mental Philosophy. Manual of Agriculture. Geology.
Spherical and Physical Astronomy. Military Engineering—Mahan. Logic.	Meteorology—Climatology, &c. Astronomy. Moral Philosophy.
Political Economy, Gillespie's Roads and Railroads. Practical Astronomy.	Nat'l Theology and Ev. Christianity. Location and Construction of Roads. Application of Science to the Arts.

Origin and Scope of the University.

The subject of advanced education has been in various forms before the people of West Virginia for years, but without any liberal provision having been made for the same until quite recently. The Constitution of the State makes it the duty of the Legislature to "*foster and encourage Moral, Intellectual, Scientific and Agricultural improvement; and to make provision for the organization of such institutions of learning as the best interests of general education may demand.*" The National Congress having donated certain lands "*in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life,*" the Legislature accepted the same, and appointed a Board to organize the Institution, with instructions to "*establish Departments of Education in Literature, Science, Art, Agriculture, and Military Tactics —including a Preparatory Department.*"

The proceeds of the sale of Congressional lands amounted to $90,000. The citizens of Morgantown contributed in grounds, buildings and money, about $50,000. The Legislature, realizing the necessity and immense value of such an Institution; its incalculable worth to the youth of the Commonwealth and of the country—scores of whom, in ever increasing numbers, have resorted to its halls—has generously appropriated $16,000* per year for the further endowment and for the current expenses of the University, having, pursuant to the formal recommendation of the Governor and in harmony with the design and scope of the Institution, changed its name from "The Agricultural College of West Virginia," to that of "West Virginia University." We trust that in the extent and in the quality of its work, and the thoroughness of its discipline and culture, as well as adaptation to the demands of the age, it will prove itself deserving of no second rate position among the Institutions of our land. It designs by its instruction in Literature and Art—in Language, ancient and modern—in Mathematics, pure and applied—in the Sciences, physical, mental, moral and social—by its recitations, lectures, examinations and elevating influences to educate, inform and discipline the student's mind; to strengthen his moral principles, and supply such general and generous as well as special culture as will best prepare him for success and usefulness in any pursuit or profession of life.

***In lieu of the above, the Legislature at its last session made a special appropriation of $22,855 to complete the new University Hall.**

DEPARTMENTS OF INSTRUCTION.

There are six of these already in operation:

1. Preparatory, designed to meet the wants of those who are too young, or who are not sufficiently advanced to enter the other Departments.

2. Literary, in extent and exactness corresponding to that of our best American Colleges.

3. Scientific, which affords a general preparation for those pursuits that require extensive acquaintance with the Sciences.

4. Engineering, at present, a branch of the General Scientific Department.

5. Agricultural, embracing the various branches of Agriculture, Horticulture, Rural Economy, and the Mechanic Arts.

6. Military, which is arranged so as not only not to interfere with, but to promote instruction and discipline in other Departments.

Lectureships in Civil and Constitutional Law, and in Physiology, Hygiene and related subjects, have also been established.

An Optional Course is allowed those students whose special tastes or necessities prevent them from graduating in any of the regular Departments.

A Normal Class, for the special advantage of Teachers, is formed every spring. In this the ordinary school studies are carefully reviewed, exactness and readiness in explanation and definition acquired, and instruction in the most approved methods of organizing and conducting schools imparted. There is also a weekly Lecture before the class on some subject connected with teaching. The following, among other subjects, have been discussed during the present year: History of Teaching, by President Martin. Theory and Practice of Teaching, by Prof. Lyon. The Teacher's Work under the Free School Law of West Virginia, by Prof. Stevens. The Moral Principle in Teaching, by Prof. Pierce. Hygiene of the School Room, by Prof. Stevenson. Superiority of American to European Methods of Instruction, by Prof. Wood.

The Trustees of the "Peabody Educational Fund," through their general agent, Dr. Barnas Sears, have placed at the disposal of the University, the sum of five hundred dollars, annually to be given to such young men of the Normal Department as need assistance to qualify themselves for higher usefulness as teachers in West Virginia.

EXAMINATIONS.

Three public examinations, at which all the students are required to be present, are held during the year,—one at the close of each term. These may be conducted by written papers or by oral questions. Reports of the deportment and scholarship of the students are sent to the parents or guardian after each examination.

CALENDAR.

The annual session of 39 weeks is divided into three terms of 13 weeks each. An interval of a few days occurs between the Fall and Winter, and between the Winter and Spring terms. Also a recess of about two weeks including the Christmas holidays. It is highly important that students be present at the first recitation of their classes. The exercises begin promptly on the day designated, and any time lost affects the standing of the student, and perhaps embarrasses his whole course. Students entering after the term has opened must take such studies as can be conveniently assigned them.

1870.	June 9,	Annual Examination begins.
"	" 12,	Baccalaureate Sermon by the President.
"	" 13,	Regents' Prize Contest.
"	" 14,	Address before the Societies, by Hon. J. W. Patterson, of New Hampshire.
"	" 15,	Commencement. Dedication of new University Hall. Address by Hon. E. M. Wilson, of Minnesota.
"	" 16,	Examination of candidates for admission.
"	Sept. 6,	" " " "
"	" 7,	Fall Term begins.
"	Dec. 2,	" " ends.
"	" 6,	Winter Term begins.
"	" 22,	Christmas recess begins.
1871.	Jan. 4,	" " ends.
"	Mar. 17,	Winter Term ends. Brown Prize Contest.
"	" 21,	Spring Term begins.
"	June 15,	" " ends. Commencement Day.

EXPENSES.

Preparatory Department............	$5.00	per Term of 13 weeks.
Other Departments...........	8.00	" " " "

Students in the Preparatory Department pay one dollar; in the other Departments two dollars per term contingent fee.

Two Cadets may be appointed by each Regent, free of charge for tuition, books or stationery. Boarding varies from $3.00 to $4.00 per week.

VOLUNTEER LABOR CORPS.

Many of our young men have found it pleasant and healthful to spend an hour or two per day, at a remunerative price, in improving and ornamenting the grounds, under the direction of the Superintendent.

PRIZES.

The following prizes have been established by the Regents, viz.:

I. To the Student who shall write the best essay upon a given subject, $25. To the Student who shall be adjudged the best Declaimer, $15. These prizes to be adjudged after public competition, by a committee of citizens appointed by the Faculty.

II. To the Student who shall be adjudged by the Faculty to excel in general deportment, $25. To the second in merit, $15. If preferred, the prizes may be given in the shape of medals, time-pieces, or books.

BROWN PRIZES.

III. The annual sum of one hundred dollars has been placed in the President's hands by Gen. G. W. Brown, of Grafton, for the encouragement of the Literary Societies, to be awarded for superiority in Essay, Oration, Declamation and Discussion.

PRIZES AWARDED.

Regents......	To D. B. Purinton,	for	general deportment......	$25 00
	To B. W. Smith,	"	" "	15 00
	To M. H. Dent,	"	Essay........................	25 00
	To W. D. Carlile,	"	Declamation..............	15 00
Brown.......	To T G. Edmiston,	"	Declamation..............	10 00
	To W. L Ledwith,	"	Essay	20 00
	To A. E. McLane,	"	Oration.........................	30 00
	To M. L. Temple,	"	Debate..........................	40 00

DISCIPLINE.

The rules of the University require that every Student shall be in his place at all stated exercises from the opening to the close of his connection with the University. A record is kept in which are entered the grade of Scholarship of each Student, his absence from the exercises of the Institution, his tardiness, or failure in recitation, unless satisfactorily accounted for. An abstract of this record is sent at the close of each Term to parents or guardians, so that they may see what, and how their wards are studying, and how they stand in scholarship and deportment. In case of negligence, irregularity, or other misconduct, the Student will be privately admonished and the parent or guardian will be informed of the fact. Mere inattention to study will, if persisted in, insure dismission from the University. No Student is allowed to leave the town during Term time without special permission.

Students from abroad, under fifteen years, should have their money sent to, and their bills settled, by Capt. Pierce, Registrar of the University.

RELIGIOUS INSTRUCTION AND WORSHIP.

The exercises of each day are opened with reading the Scriptures and prayer, at which all the Students are required to be present. They are also required to attend regularly some place of religious worship on the Sabbath, and on all occasions to treat the institutions of religion with respect.

LIBRARY.

A respectable beginning towards a University Library has already been made. About fifteen hundred volumes have been carefully selected and placed on its shelves, including not only many choice and valuable books of reference, but also standard works in the various departments of History, Biography, Theology, Agriculture, Art, Science and General Literature.

We respectfuly request the friends of Education to make contributions to its shelves.

Copies, also, of the Daily Wheeling Intelligencer and Tri-Weekly Wheeling Register, and of nearly all the weekly journals in the State, as well as several from other States, have been cheerfully donated to the Reading Room of the University. We trust these are but the beginnings of larger giftts. We earnestly call upon our friends everywhere, and especially, upon the citizens of our own State, to aid us in collecting and forwarding to their University, samples of anything rare and valuable in the animal, mineral, or vegetable kingdom, or any thing serving to illustrate the antiquities, natural or civil history, geology, botany, mineralogy, &c., of the State, or any section of the State or world.

MUSEUM, APPARATUS, &c.

The University is in possession of apparatus requisite for thorough illustration of Chemistry and Physics.

The Museum contains numerous specimens in Mineralogy, Geology, and the various departments of Natural History; also, a collection in Palæontology with characteristic specimens from all the formations. Other collections are to be deposited by their owners. We request all who are interested in such subjects to send suitable specimens for the Museum, especially Indian relics, shells, minerals, fossils, and alcoholic specimens of animals. Such donations will be acknowledged and carefully labeled with the name of the donor.

The vicinity of the University offers unrivalled advantages for the study of practical Geology. Especial attention will be paid to this branch.

The laboratory of Practical Chemistry will be in full readiness during 1870–71. The instruction for the present will be devoted chiefly to analysis, with its application to agriculture.

Donations to the Museum have been received as follows:

Adams, J. C. French coin, copper,

Border, D. W. Fluviatile shells from Monongahela river.

Cox, Miss E. J., Wheeling. Copy of last issue of Vicksburg *Citizen*.

Carrico, Alfred, Morgantown. American coins, copper.

Darlinton, J. W. Colymbus torquatus.

Dering, Miss H. L., Morgantown. Fluviatile shells.

Dent, M. H. Fluviatile shells; Stigmaria ficoides.

Hewitt, C., Linton, O. Indian relics.

Hanaway, W. A., Morgantown. Agate.

Houston, James. Crystalline limestone.

Harding, N. B. Ectopistes migratorius; Sialia Sialis; Colaptes auratus; Sturnella magna.

Harris, Amos, Morgantown. British half-penny, 1775.

Knox, P. C. American coins, copper.

Lazier, H. B., M.D., Morgantown. Turbo.

Loar, S. S., Preston county. Proto-carbonate of Iron.

Layton, Mrs. M. V., Morgantown. Copper coin, unknown.

Layton, L. S., Morgantown. French and American silver coin. U. S.

Ledwith, W. L. Fractional currency; Melania from Lake Erie.

Lorentz, A. W., Morgantown. Mexican dollar.

McClure, T. B., Moran, E. E., Durbin, J., Schaffer, G. C. } Picus villosus; Picus pubescens; Cyanurus cristatus; Parus atracapillus.

McLane, Alan E. Pipilo erythrophthalmus; Quiscalus versicolor; Turdus migratorius.

Moore, Mrs. E. I., Morgantown. Sea mosses from North Pacific.

Moore, C., Fitch, P., Wilson, E. W. } Bucephala albeola.

Saer, J. W., Morgantown. Specular Iron.

Scott, D. J., " U. S. Fractional Currency.

Tolivar, J., Wheeling. Madrepore; Back of Sequoia gigantea: polished specimen of wood of Oreodaphne Californica; Cardita.

Wagner, J., Wheeling. American dollar and half dollar, 1796 & 1795.

Webb, C. B., Wayne county. Indian relics.

Willey, Rev. Chrome iron.

Willey, Mrs. W. T., Morgantown. Cupule of acorn from Texas.

DEPARTMENT OF MILITARY SCIENCE AND TACTICS.

The National endowment of the University requires provision to be made for instruction in Military Tactics. The Board of Regents has provided the facilities for carrying out these obligations. Experience has demonstrated the wisdom of the plan.

The Course of Instruction embraces Infantry, Cavalry and Artillery Tactics; the use of the Bayonet and Sabre; Ordnance and Gunnery; Military engineering, and the Science of War.

Attendance upon the exercises is made obligatory upon cadets, and the regular University classes, unless exempted therefrom, by the Faculty, for adequate cause.

A full uniform has been adopted for the cadets, to be made after the University pattern, harmonizing, as far as may be, the elements of neatness, economy and utility.

The exercises occupy one hour daily, on the afternoon of Monday, Tuesday, Wednesday and Thursday of each week, at times not to conflict with regular recitations.

Instruction is given in the form of class lectures on the subjects of Science of Gunnery, Military Engineering and the Art of War.

LITERARY SOCIETIES.

There are two of these in connection with the University, furnished with suitable halls, and whose exercises of Composition, Reading, Orations, Debate and Criticism are, in many respects, of great advantage to the student. They also afford facilities for the study of, and acquaintance with, parliamentary forms, and the acquisition of business habits. The authorities of the University will afford every facility for increasing the accommodations and usefulness of these valuable auxiliaries.

LOCATION.

Morgantown, the seat of the University, is beautifully located on the right bank of the Monongahela river, Monongalia county, West Virginia. The scenery around is exceedingly attractive and picturesque. The place has long been famous for its social, intellectual and moral culture, and general healthfulness. Coaches leave every morning to and from Fairmont, on the Baltimore and Ohio Railroad. There is also a daily conveyance between Morgantown and Uniontown, Pa. Steamboats from Pittsburgh arrive every day at Geneva, twelve miles below Morgantown. A place more eligible for the quiet and successful pursuit of Science and Literature is nowhere to be found.

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THE NEW UNIVERSITY BUILDING,

Now completed, is a model of architectural beauty and convenient arrangement, greatly increasing the facilities for carrying out the noble designs for which the University was established.

"B" = pp. 41-73.

A GEOLOGICAL EXAMINATION

OF

MONONGALIA COUNTY,

WEST VIRGINIA,

BY

JNO. J. STEVENSON, PH. D.

PROFESSOR OF CHEMISTRY AND NATURAL HISTORY, IN WEST
VIRGINIA UNIVERSITY;

TOGETHER WITH

LISTS OF FOSSILS & DESCRIPTION OF NEW SPECIES,

By F. B. MEEK,

OF THE SMITHSONIAN INSTITUTION.

WHEELING:
1871.

MONONGALIA COUNTY.

GENERAL DESCRIPTION.

Monongalia county, lying on the northern border of West Virginia, is bounded on the north by Pennsylvania, on the east by Preston county, on the south by Preston and Marion counties, and on the west by Wetzel county. In shape it is irregular, the length, east and west, being about forty miles; the width, north and south, varying from twelve to twenty miles, and the area being not far from six hundred square miles. The surface is much broken. While the soil, especially in the eastern part of the county, is thin, seldom more than ten inches, the valleys are fertile, and even the hill sides yield good crops of grass as well as very fair crops of corn, where farmers are foolish enough to cultivate them. The county is well watered by the Cheat and Monongahela rivers, as also by their numerous tributaries. In the sections yet unsettled the hills are covered by a dense growth of large timber, chiefly beech, maple, walnut, chestnut, tulip tree and several species of oak. In many localities the underbrush is principally laurel, which sometimes forms thickets so close as to recall to mind the jungles of the torrid zone.

The violent convulsions, so conspicuous throughout the whole Appalachian region, have rendered the scenery exceedingly attractive. At the gap of Cheat, where the river breaks through Laurel Hill, the mountain rises almost precipitously on each side to a height of nearly twelve hundred feet, while there and for miles below, the river bed is choked by vast masses of rock which have fallen from the sides. On some of the smaller streams the scenery is hardly less striking. One can hardly conceive of anything wilder or more picturesque than the gap in Laurel Hill made by Decker's Creek, where for nearly two miles the bed of the stream is entirely lost among the immense fragments of rock, while the sides of the chasm, steep and covered with laurel thickets, almost defy ascent. Perpendicular bluffs, forty or fifty feet in height, and consisting solely of huge fragments of conglomerate, at times so close the gap as to prevent further progress; and at some points the sun, even in summer, can be seen for not more than three or four hours each day.

Owing to the general steepness of the hills, the superficial deposits are usually thin, except along the creeks and rivers, where broad, deep "bottoms" are common. Along the Monongahela there are distinct evidences of two or probably three terraces, which are best visible near Morgantown. The upper terrace has been almost disguised by erosion, but it contains large numbers of fluviatile shells in a semi-fossilized condition. Among the species found in these terraces the most common are *Unio clarus, U. obliquus, U. rectus, U. ligamentinus, U. ovatus, U. cicatricosus, Margaritana marginata, and Melantho decisa,* which are also the species of most common occurrence in the river. Some of the streams have evidently changed their course at no very distant period. The ancient bed of Scott's Run, in shape resembling a horse's shoe, can be traced easily near Boyer's Mill. It is to be regretted that no records have been kept of the strata passed through in digging wells, for in no locality have I seen a good exposure of the superficial deposits. West of the river, on the Fairmont road, Mr. Keck dug seventy-one feet through alluvial deposits before reaching solid rock or a permanent supply of water. East of it, near Morgantown, a well was sunk forty-four feet before rock was found.

The American Indian no longer inhabits this county, but as this was a portion of the common hunting ground west of the Alleghanies, relics, such as implements, pottery and bones, are of frequent occurrence. Not far from Morgantown, near the Kingwood road, is a mass of stone covered with rude engravings of animals, which are now almost effaced. Most of these drawings are undoubtedly the work of Indians, though some probably were made by the early settlers. Earth mounds of circular shape, and stone heaps of similar form, are common. A burying place may be seen at Smithtown, and an old battle field, on Mr. Dorsey's farm, occasionally yields some remains. Mr. Moses D. Wells has obtained numerous fragments of pottery from the Decker's Creek "bottoms" about two miles from Morgantown. He has observed that in almost all cases the pottery contained fragments of Uniones. At Granville, arrow and lance heads, with hatchets and pipes, have been obtained in considerable numbers. Mr. Dorsey ploughed up on his farm a perforated disc, four inches in diameter, similar to those figured by Mr. Lapham in his "Antiquities of Wisconsin." Some years ago a fine collection of Indian antiquities was made in this county, but, unfortunately, it has become so scattered as to be unavailable. In making this collection, many of the mounds were opened and their contents removed, so that it is now doubtful whether a complete series of the "remains" can be found in Monongalia county.

GEOLOGICAL STRUCTURE.

The anticlinal axis of Laurel Hill passing from northeast to southwest through the eastern portion of the county brings to view, as capping the mountain, the great conglomerate, and toward the bottom of the gaps made by Cheat river and Decker's Creek, the triple series of the lower carboniferous is fully exposed.

The conglomerate is succeeded by the coal measures, which, as in the bituminous coal field of Pennsylvania, seem to be divided naturally into four groups, the first or lower coal group resting directly upon the conglomerate, and reaching to the Mahoning sandstone; the second, or lower Barren group, reaching to the Pittsburgh coal; the third, or upper coal group, beginning with the Pittsburgh and closing with our Waynesburg (?) coal; the fourth, or Upper Barren group, including all beyond the last named coal. Yet the division seems to be made better at the Pittsburgh coal, being more convenient and more in accordance with the distribution of the fossils obtained.

The main line of section extends from a point on Decker's creek, two miles above Hagidore's Mill, along Decker's creek to its mouth, at Morgantown, along the Monongahela to the mouth of Scott's Run, and up the run to a point nearly one mile above Cassville, thus including only the eastern third of the county, which, however, contains nearly all that is of interest, economically or scientifically. Local sections have been made on Cheat river, Booth's and White Day creeks, as well as on several of the smaller streams.

LOWER CARBONIFEROUS.

The lower carboniferous rocks are visible, as a whole, at only two localities, the gaps in Laurel Hill, made by Cheat river and Decker's creek. The formation here assumes a three-fold character: at the bottom, sandstones; in the middle, limestone; and on the top, red or olive shales. The sandstones are not well exposed, where examined, though doubtless, at other points in the gaps, better exposures may be found.

The limestone is not a homogeneous mass, but is divided by calcareous shales, of varying thickness, into numerous layers, or possibly independent strata. It appears to be fossiliferous throughout, though specimens have been collected only from the topmost portion, at or near its junction with the shales above. At the base a few specimens were obtained, but no effort was made to secure a representative collection, as I did not intend originally to include the lower carboniferous in this section.

The fossils from the upper portions belong chiefly to the genera, Productus, Spirifer, Athyris, Allorisma, and Bellerophon. Specimens of the last named genus are exceedingly numerous, but, for the most part, so badly preserved as to render determination of the species almost impossible. Mr. Meek has identified several of the forms from this limestone with species occurring in the Chester group of the western States, while others are closely allied to forms occurring in that group. Two, perhaps three, of our species are identical with forms which have been known hitherto only in the coal measures. This portion of the limestone is referred, therefore, by Mr. Meek, to the horizon of the Chester group. It is highly probable that more careful examination (already begun) of the whole limestone will show that others of the lower carboniferous groups, as determined in Illinois and Iowa, are represented here.

Caves are quite numerous in this limestone, and will, doubtless, yield some interesting mammalian remains when properly explored.

This group sinks under Cheat river, about one mile and a half above Ice's Ferry. Its thickness above that point is about ninety feet. On Decker's creek it seems to be somewhat more.

The shales are not well exposed at any accessible locality west of Cheat river, but east of that river they can be examined along the Brandonville pike. As in Pennsylvania, they include several veins of iron ore, very pure and in large quantity. These were worked many years ago by furnaces east of the river, but the openings are now concealed so that the veins are traceable with difficulty. They have not been observed west of the river. The shales are not sufficiently disclosed to permit accurate measurement, but their thickness does not appear to exceed one hundred and twenty-five feet.

The Sharon coal group of Rogers seems not to be represented here.

THE CONGLOMERATE.

This formation consists mainly of sandstones, varying in grain and color, and shales mostly arenaceous. Several deposits of iron ore occur, but their value is yet undetermined. Mr. Moses D. Wells, who acted as aid to Dr. Briggs while he was running sections in this portion of the State for the survey of Virginia, informs me that toward the middle of the conglomerate, and seventy-five feet apart, there occur two seams of coal—one fifteen inches, and the other from fifteen inches to more than three feet thick. The latter, he states, has been worked to some extent near the Brandonville road, and yields a coal of very fair quality. Neither of these beds appear on Decker's creek.

The succession of strata, as shown by a boring made near Hagidore's mill, on Decker's creek, is as follows :

		Feet.	In.
1st.	Hard sandstone, with seams of iron ore	22	4
2nd.	Shales	2	8
3rd.	Sandstone with carbonaceous matter	12	8
4th.	Shales	1	8
5th.	Sandstone, white	9	0
6th.	Sandstone, black	18	0
7th.	Sandstone, gray, coarse	14	0
8th.	Shales, black	16	6
9th.	Conglomerate, white, with quartz pebbles	13	0
10th.	Shales, red and blue	10	10
11th.	Sandstone, blue, fine	23	6
12th.	Sandstone, white, fine	25	6
13th.	Shales, dark, with iron	6	0
14th.	Sandstone, blue, fine, very hard	18	0
15th.	Sandstone, gray, very hard	15	0
	Total number of feet	208	00

If we may trust the records of boring made west of the Monongahela, which, however, seems to have been made carelessly, the shales are not persistent, for the succession, as given, is as follows:

1st. Sandstone, white, very hard.
2nd. Sandstone, blue, " "
3rd. Sandstone, white, " "
4th. Sandstone, blue, softer.
5th. Sandstone, white, fine.
6th. Sandstone, white, coarse.
Depth 218 feet.
7th. Sandstone, blue, very hard.
8th. Sandstone, white, coarse.
9th. Sandstone, black, very coarse.
10th. Sandstone, white, very hard.
11th. Sandstone, white, coarse.
12th. Sandstone, white.
13th. Sandstone, blue, fine & hard.
14th. Sandstone, white.
15th. Sandstone, dark, very coarse.

I do not give the thickness of each stratum, as I could not determine from the record. The total thickness of the formation is between three hundred and fifty and four hundred feet. On Cheat it disappears near Ley's mill, and on Decker's creek near Guseman's bridge.

LOWER COAL MEASURES.

1. *Shales.*—Argillaceous, of yellowish gray color, laminated and of fine grain; disintegrates readily upon exposure to the air. These shales contain an impure proto-carbonate of iron, known to the older residents as the Stratford ore. This is found in two layers, the lower about one foot thick and quite persistent, the upper very irregular. Ferruginous nodules occur throughout the stratum. Though the ore is quite impure, it worked well when mixed with better ores, and was mined rudely but rather extensively for the old furnace. The excavations are still visible in many places on the mountain and along Decker's creek. In several instances a thin seam of *coal*, about four inches thick, was cut by the miners. It lies near the middle of the shale.

Thickness, *ten* feet.

2. *Coal No. I. A.*—Thin, but of very fair quality. This and No. I. B. have been observed at but one point on Decker's creek, on the left-hand side, ascending, about two hundred feet below Guseman's bridge.

Thickness, *one* foot.

3. *Sandstone.*—For the most part very light gray, fine grained and compact. At the bottom, and near the middle, are bands of black, arenaceous shale, containing indistinct vegetable remains. The light colored portions split readily into flags, which are good for furnace hearths.

Thickness, *four* feet.

4. *Coal No. I. B.*—At the point of observation, this contains four thin seams of coal, respectively four, one, one and one-half, and eight inches thick, separated by thin bands of shale. At the outcrop this coal appears to be of fair quality. This, with the thin seams already referred to, appears to be the representative of the *Tionesta* group in Pennsylvania.

Thickness, *one* foot *eight* inches.

5. *Shales.*—Brown colored and argillaceous; contains numerous nodules of iron ore, which are of small size and of little value. These shales are not well disclosed at the point where they were examined—below Guseman's bridge—but their thickness is about *twenty-five* feet.

6. *Sandstone.*—Coarse, siliceous, gray, though sometimes yellowish. It varies greatly in its grain, passing from a conglomerate to a comparatively fine sandstone. Near Guseman's bridge it is made up of alternate bands of compact and shaly sandstone. The compact portion has been employed for furnace hearths. A thin seam of coal, three or four inches thick, was struck in this stratum by Mr. Guseman, in sinking a well near his dwelling house. This is the *Tionesta* sandstone, which in some portions of Pennsylvania attains a thickness of fifty to sixty feet.

Thickness, from *twenty-five* to *thirty* feet.

7. *Shales.*—Bituminous above, argillaceous; best disclosed on Tibb's run, above Guseman's.

Thickness, *fifteen* feet.

8. *Coal No. II.—Brookville coal,* of H. D. Rogers. This seam has been opened at several points along our line, and is in high repute for domestic use. It is friable, free from iron pyrites, and is well adapted to smiths' use. The coal is frequently of the irised or peacock variety, and at an old opening in Deep Hollow, southeast of the furnace, the seam contains nothing else. It disappears under the creek near the old furnace.

Thickness, rarely exceeding *two* feet.

9. *Flaggy Sandstones and Shales.*—On Decker's creek, the lower portion is not well disclosed. The upper appears to be identical with shales lying northeast of the furnace, and containing the "Swisher" ore.

As well as can be determined, the thickness is not far from *thirty* feet.

10. *Coal No. III.—Clarion coal,* of Rogers? I have had no good opportunity to examine this coal, as it has not been worked for many years. The openings and most of the exposures have been so concealed by heavy slides, that direct information can be obtained only with great difficulty. I have been informed by old miners that the coal bears a strong resemblance to cannel. It disappears under the creek, about two miles below the furnace.

Thickness, as given to me, *three and one-half to four* feet.

11. *Shales.*—At no point fully disclosed. The lower portion is laminated and very bituminous, burns with great ease, and has been mistaken for cannel coal. The central portion contains some bands of flaggy sandstone. The upper part is argillaceous, and contains numerous nodules of iron ore, which were at one time taken to supply the old furnace.

Thickness, between *thirty* and *forty* feet.

12. *Limestone.—Ferriferous Limestone.* This stratum is frequently double, with a foot or more of shale intervening. I have been informed by Mr. Wells that at one locality this shale is several feet thick. The

limestone is blue, gray or yellow, of fine grain, and very compact. Near the top it is quite ferruginous, frequently so much so as to be a calcareous ore, as which it was worked at the neighboring furnace and at the furnace of Mr. Hagans, on Muddy creek. This stratum has been found useful as a flux, as well as a source of lime, for which purpose it has been burned by Mr. Guseman. The lime answers well enough for ordinary building purposes, though not sufficiently white for finishing inside work. The stratum is easily accessible, so that it might be quarried and burned for agricultural purposes.

Thickness, usually from *four* to *five and one-half* feet.

13. *Shales.*—Argillaceous, and for the most part of a grayish color, containing some ferruginous nodules of excellent quality, but in too small quantity to be available.

Thickness varies from *five* to *ten* feet.

14. *Sandstone.*—Gray, micaceous, compact, and splitting into flags.

Thickness, *five* feet.

15. *Shales.*—Argillaceous, of dark color and fine grain. These shales contain a seam of very fine iron ore about one foot thick. This may be examined to advantage in Deep Hollow, where it was taken out for the furnace. The nodules frequently have fern leaves for their nucleus, and retain sharp impressions. The deposit does not seem to be regular, for in one or two localities the ore was soon worked out.

Thickness of the whole stratum, from *eight* to *ten* feet.

16. *Coal No. IV.—Kittanning coal(?)* This seam is divided by a thin seam of slate, about one foot from the bottom. The top is rendered somewhat impure by iron pyrites, but towards the middle, and especially below the slate, it is remarkably free from impurities, and owing to its purity this coal is in high repute as smith's coal, and has been hauled to Morgantown from Clinton Furnace, a distance of ten miles, the purchasers being ignorant of its exposure on Decker's creek. This stratum runs out in the hills near the furnace, and disappears under the creek about a mile below. One mile above Morgantown, it is seen in the river bed, and can be reached at very low water. It was, at one time, worked here to supply the village. Openings may be examined on Decker's creek, Tibb's run, Booth's and Aaron's creek, and on Cheat river.

This seam has been identified by Prof. H. D. Rogers with the Upper Freeport coal, on the ground, perhaps, that it is a double bed. In the section made by Dr. Briggs, given in W. B. Rogers' report for 1840, a bed of coal, one foot thick, is laid down as occurring twelve feet below our coal No. IV. Though I have made diligent search, I have failed to find this small vein, nor do any of the old iron-diggers, who, twenty-five years ago, opened up the whole hill-side, know anything of its existence. Some years ago, Mr. Guseman, in searching for the Ferriferous Limestone, stripped the whole surface from coal No. IV. to the limestone. In the section thus exposed no such stratum occurs. If the inferior bed does exist, it must be of limited extent. The data, then, on which Prof. Rogers based his identification, appear to be erroneous.

From the character and arrangement of the adjoining strata, I am rather inclined to regard this as the Kittanning coal. The average distance between it and the Ferriferous Limestone is between twenty-five and thirty feet, which is nearly the same as the average distance in Pennsylvania. It may, however, prove, upon more extended examination, to be the Lower Freeport.

Thickness, varying from *four* to *five*, but usually about *four* feet.

17. *Shales.*—Black, very bituminous, fine grained, laminar, and with conchoidal fracture. These shales resemble those overlying Coal No. III, but are more bituminous, and are more likely to be mistaken for cannel. The material burns with great ease, and the lower two to four feet are usually worked with the underlying coal, which is, therefore, known generally as the "six-foot vein."

Thickness, *ten* feet.

18. *Shales.*—Argillaceous, grayish. About half-way between the furnace and forge. A thin stratum of impure limestone occurs in these shales. The existence of this limestone was discovered at too late a date for me to determine its character in time for this report.

Thickness, *fifteen* feet.

19. *Coal No. V.—Upper Freeport Coal.*—A thin seam of rather good quality, which has been slightly worked by persons living in the vicinity. Though small, this vein is persistent, and I am inclined to refer it to the upper Freeport, because of the limestone below, which I believe to be the Freeport limestone. It is the only representative of the Freeport coals in our section, unless No. IV be regarded as lower Freeport, which, however, seems hardly probable.

Thickness, *fifteen* inches.

20. *Shales.*—Dark colored, fine grain, argillaceous, and contains many small nodules of iron ore. It appears to be identical with a stratum of dark shale in Ohio, underlying the Mahoning sandstone, and like this, abounding in fossils. These fossils are referable chiefly to productus, nucula, soldia, macrocheilus, and bellerophon. Specimens of phillipsia have been found here. This stratum is seen to best advantage in the bluff bordering the "bottoms," two or three hundred yards above the old "Point House."

Thickness, *twelve* feet.

21. *Sandstone—Mahoning sandstone.*—Coarse grained, micaceous, quite compact. The upper portion is flaggy, but below it can be quarried in blocks several feet thick. This important stratum runs out in the hills a little below the furnace. At the old forge the lower half disappears under the creek; but owing to the rapid fall of the creek, as well as to a slight change in the direction of dip, the greater part becomes again visi-

ble, so that at the mouth of the creek, near Morgantown, about fifty feet are exposed. On Booth's creek, four miles above Morgantown, the rock is fully exposed, and there it is about *seventy-five* feet thick. At that locality it appears to be less compact than at the forge or at Morgantown, weathering so as to show deep cavities, whence its local name, "Raven Rocks." As exposed at Morgantown and along Decker's creek, this stratum affords most excellent building material.

22. *Shales.*—Argillaceous, red or olive-brown, laminar, and of fine grain, includes a layer of iron ore about six inches thick, of not very good quality. When mixed with purer ore it may be worked to advantage, and for this reason it was taken out very largely near the forge to supply the old furnace.

Thickness, *ten* to *fifteen* feet.

23. *Sandstone.*—Grain coarse, quality variable, micaceous, light gray. Upper portion for about two feet sufficiently compact for rude building. The lower portion is flaggy, and in some localities becomes an arenaceous shale. In Falling run, on the University property, it breaks into slabs scarcely one-fifth of an inch thick.

Thickness, varies from *ten* to *twenty* feet.

24. *Shales.*—Argillaceous, variegated. Toward the bottom is a deposit of iron ore, sometimes eighteen inches thick. At the top another deposit occurs, less regular than the one below. Both of these were worked for the old furnace, and yielded ore of a fair quality, but the deposit seemed uncertain and sometimes disappeared.

Thickness, about *twenty* feet.

25. *Limestone.*—Dark blue, of fine grain and irregular fracture. This stratum furnishes cement of very fair quality, but, though this has been known for thirty years, no use has been made of it.

Thickness, *five* to *six* feet.

26. *Shales.*—Argillaceous, variegated, olive colored below, lead gray above, and nodular or concretionary in many places. The whole stratum is nowhere satisfactorily exposed, but can be to best advantage in Falling Run ravine and by the road to the north of it. These shales, with No. 28, seem to be persistent members of this group. I have obtained a single impression of *Neuropteris hirsuta* from this stratum.

Thickness, about *forty* feet.

27. *Limestone.*—As disclosed in Mrs. Purinton's ravine, near Morgantown, this stratum consists of three layers, the lower, four inches thick, is light blue, fine grained, compact, and quite pure, ringing when struck by the hammer; the middle, twenty-four inches thick, is yellow, very ferruginous, and breaks with an earthy fracture; the upper, fifteen inches thick, resembles the lower layer. As disclosed by a "wash" in the hillside, north of Falling Run, near the University, this stratum is earthy throughout, with dendritic markings. On the opposite side of the run it is quite pure.

Thickness, *three* and *one-half* to *four* feet.

28. *Shales.*—This stratum is rather a small group as locally developed, and may be sub-divided as follows:

1. Brown or olive colored shale, containing some calcareous nodules. *Six* feet.

2. Fire clay. *Three* inches.

3. Olive colored shale, containing many fossils—*Chonetes granulifera, Hemipronites crassus, Pleurotomaria gravilliensis, Bellerophon percarinatus, B. carbonarius. Nucula parva, N.* (?) *anodontoides,* Meek, (n. sp.) and *Macrodon obsoletus,* Meek, (n. sp.) are the most characteristic. Species of Spirifer and Productus are not uncommon, and the pygidium of a minute trilobite was obtained, but, unfortunately, has been misla'd. I have obtained from it a single specimen of Petalodus Alleghaniensis. *Four* feet.

4. Calcareous nodules, containing great numbers of *Nucula parva* and *Chronetes millepunctata. One* foot.

5. Dark shale, containing few fossils, principally Chronetes and Nucula. *Twelve* feet.

Number 4 has been burned for lime, and has yielded good material. The whole series can be well studied at only one locality, viz: The "wash" already referred to, on the north side of Falling Run. Fossils from the top layer can be obtained at the "Hog Back" on Decker's Creek.

Total thickness, ——— feet.

29. *Shales.*—Blue, gray or black, varying in different localities, the black variety weathering brown; usually calcareous, and sometimes changing into impure limestone. The more argillaceous varieties disintegrate quite readily, and on exposure to water become plastic. Though thin, this is a persistent stratum, being recognizable one hundred miles south of our line, and it may be equivalent to Prof. Rogers' Green Fossiliferous Limestone of the Pennsylvania Barren Measures.

It is rich in species of Athyrus, Productus, Spirifer, Chronetes, and Myaline, most of which are of wide range geographically. Some crinoidal stones and two or three fragments of a branching coral have been found. These fossils can be obtained in the bed of Falling Run, one-fourth of a mile above Mr. Chalfant's residence, at the "Hog Back," and at Mr. Harner's, on Decker's Creek. The stratum is visible at several localities along Decker's Creek, below the old forge, and is well exposed in several of the ravines near Morgantown.

The thickness varies from *two* to *four* feet, being less as we recede from the mountain.

30. *Sandstones.*—Dark colored, micaceous, tough; shaly below but compact above. Not unfrequently a thin stratum of argrillaceous shale interposes between 29 and 30.

Thickness varying from *one* to *four* feet.

31. *Shales.*—Argillaceous, gray to blue in color, and of fine grain. Towards the middle is an irregular seam of iron ore, from six to twelve

inches thick. The strata from No. 31 to *Coal No. VI.* can be seen in detail only on Falling Run, being more or less concealed at all other localities examined along the line of section.

Thickness, *ten* feet.

32. *Sandstone.*—Micaceous, light colored, compact on top for twenty inches; below separating into thin slabs. Contains nodules of iron ore.

Thickness, *ten* feet.

33. *Shales.*—Argillaceous, blue, with calcareous nodules.

Thickness, *ten* feet.

34. *Shales.*—Argillaceous, gray to yellow, and contains large quantity of iron ore.

Thickness, *three* and *one-half* feet.

35. *Coal No. VI.*—In the second and third basins of the Pennsylvania bituminous field, there is a persistent coal bed holding a middle position in the Barren Measures, and usually overlaid by a coarse, heavy sandstone. The coal is hard and brilliant, and varies in thickness from one to four feet. There can be little doubt that this is identical with our *Coal No. VI.*

This bed runs out in the hills near the old forge and sinks under the Monongahela, near Granville, two miles below Morgantown. The upper part is very poor—genuine "horseback"—but the main body of the bed, though of slaty structure, is usually quite pure, contains little iron pyrites, has rather more fixed carbon than any other coal on the line section, and is without doubt a very good coal for domestic use. It was opened many years ago near Decker's Creek, on land belonging to Mr. Wells, and at a height of nearly two hundred feet above the stream. About twenty-five years ago it was opened on the hill opposite the University buildings, and quite recently it was opened by Mr. Hagans, near the Maryland turnpike. Owing to the thinness of the bed and the proximity of the Pittsburgh coal, the workings have not proved profitable.

Thickness, from *two* and *one-half* to *three* feet.

36. *Flaggy Sandstones*, with intercalated shales, sometimes changing almost entirely to argillaceous shale. Sandstone coarse grained, micaceous, and of gray color.

Thickness, *fifteen* feet.

37. *Conglomerate.*—This curious stratum is made up of fragments of limestone, sandstone and iron ore, in size from fine sand to that of a man's head. These fragments are usually rounded as if by the action of currents existing before and probably at the time of deposition. Thin layers of homogeneous sandstone and shale may be traced sometimes for a considerable distance, and on Falling Run there may be seen a layer of iron ore one foot thick.

The thickness varies from a few inches to several feet, depending in great measure upon the size of the fragments. The extent of this stratum has not been determined.

38. *Shale.*—Argillaceous, dark colored; probably local. Place of observation, Falling Run.

Thickness, perhaps *ten* feet.

39. *Sandstone.*—Color gray, micaceous, grain coarse.

This is a valuable deposit. The lower portion is usually solid and compact, affording a handsome and durable building stone. It may be quarried in blocks several feet thick. The lines of deposition are often well marked, and not unfrequently the rock has a yellowish tint, due probably to the presence of iron. It breaks readily in good shape, and is dressed easily. From this stratum was obtained the stone used in building the foundation and basement story of University Hall at Morgantown. The upper portion presents a curiously shattered appearance, which is due in some measure to the decomposition of ferruginous nodules.

This stratum presents an interesting example of the rapidity with which coal measure strata change their general appearance. At a quarry opposite the University the compact portion, so far as exposed, is nearly twenty feet thick, while at a distance of less than one-half mile, on the right branch of Falling Run, the whole stratum has become flaggy, offering no layers more than five or six inches thick.

This sandstone is visible on the banks of the Monongahela, as we descend, until very near the mouth of Scott's Run, where it disappears under the river. It is not fully exposed at any one locality, but from observations made at different points its thickness is estimated at not less than *forty* feet.

40. *Shale.*—Argillaceous, and of fine grain. Color, brown or reddish. Toward the top it contains a few calcareous nodules.

Thickness, *twelve* to *fifteen* feet.

41.—*Limestone.*—Ferruginous, of a yellow tint, and is moderately pure. It has been burned for lime.

Thickness, *three* feet.

42. *Shales.*—Not well exposed.

Thickness, perhaps *ten* feet.

43. *Limestone.*—This occurs in three layers, separated by layers of shale, containing fragments of limestone. The lower layers are somewhat ferruginous, of a yellow color, and scale off upon exposure to the atmosphere. The upper layer is quite pure, of gray color, with fine grain and conchoidal fracture.. This stratum has been resorted to quite extensively as a source of lime for building purposes. It however requires to be burned with care, or the lime will not slack readily. It is visible along the river road for some distance above Scott's Run, but is best exposed at the mouth of that stream.

Thickness, *eight* feet.

44. *Coal No. VII.*—A thin seam, seen along the Scott's Run road near the river, and along the river road above the run.

Thickness, *eight* to *fifteen* inches.

45. *Sandstone.*—Compact below, but shaly above; frequently shaly throughout. Contains a good deal of iron towards the top. Its crevices are filled with stalagmitic limestone or "drip lime."

Thickness, *ten* feet.

46. *Coal No. VIII,*—A thin seam, varying much in thickness. It is best exposed a little above the mouth of Scott's Run, along the road leading up the run. The coal is evidently of very poor quality, for nearly the whole outcrop is coated with copperas. Though well-developed at and below the mouth of Scott's run, this bed seems to thin out toward the west, as it was not seen in the bed of a little stream descending the run from Boyer's opening in the Pittsburgh coal. The bed of this stream affords an almost vertical section of everything from No. 43 up to the Pittsburgh.

Thickness varying from *fifteen* inches to *two* feet.

47. *Shales and Shaly Sandstone.*—Below argillaceous, in the middle an arenaceous shale, and on top a rudely laminar, somewhat compact sandstone.

Thickness, from *fifteen* to *eighteen* feet.

48. *Limestone.*—Dull yellow on weathered surface, very compact and of fine grain. Well disclosed at Boyer's mill under the falls.

Thickness, *eighteen* inches.

49. *Sandstone and Shale.*—The layers vary somewhat in character, yet not sufficiently to render separation necessary. No. 1 is laminar, and presents some interesting features in the lines, which show the existence of eddies. No. 2 is of a bluish color, contains a little mica and exfoliates on exposure. No. 3 is a shale, of brown color, fine grain and slaty cleavage. No. 4 is a thin, light gray sandstone, very compact and unaffected by the weather. No. 5 is an arenaceous shale, containing some iron ore. In the bed of the little stream running from Boyers' opening, already referred to, No. 1 contains a large quantity of apparently good ore. At Boyers' mill the nodules are not numerous, though masses weighing more than one hundred pounds have been found there.

Thickness, *twenty-two* feet.

50. *Limestone.*—Quite ferruginous, weathering yellow, compact, of fine grain and irregular fracture.

Thickness, *eighteen* inches.

51. *Shale.*—Argillaceous, of yellow tint on outcrop, owing to the large amount of iron ore.

Thickness, *four and one-half* feet.

52. *Limestone.*—Brownish yellow, compact, with irregular fracture, contains some mica. It is highly probable that this would yield hydraulic lime.

Thickness, *three* feet.

53. *Shales.*—Arenaceous, reddish-brown.

Thickness, *eight* feet.

54. *Sandstone.*—Like No. 39, this stratum varies greatly and rapidly in its characters. In the stream from Boyers' opening it is in laminar plates, coarse grained and friable Further up the run, just below Haigh's mill, it is compact, and furnishes an excellent building stone. It is gray, micaceous and contains some feldspathic sand. The compact portions, when struck with a hammer, yield a very fetid odor, whence the local name, "Polecat Rock." A limestone layer, from which lime has been obtained, is said to occur below Haigh's mill.

Thickness, *twenty-five* feet.

55. *Shale.*—Not well disclosed. Disintegrates rapidly on exposure.

Thickness, about *three* feet.

56. *Coal No. IX.*—A thin seam, but very good quality. It was slightly worked at one time.

Thickness, *one foot and one-half* to *two* feet.

57. *Limestone.*—Black from admixture with carbonaceous matter. Its structure varies from compact with semi-conchoidal fracture to earthy. The former character is visible at Boyers' opening, the latter near Haigh's mill. The compact portions burn into quicklime of good quality.

Thickness, *two* to *four* feet.

58. *Shale or Sandstone, or both.*—This stratum is subject to very considerable variation. At the new opening made by Mr. Boyers into the Pittsburgh coal, we find a compact, flaggy sandstone, splitting readily into flags from two to six inches thick, and so hard as to be dressed with difficulty. At Haigh's opening we find a shale, soft, variegated, somewhat micaceous, and containing a large proportion of iron ore. The shale appears to be the normal condition, and the ore is evidently the same as that so well known in Pennsylvania as the "Oliphant Blue Lump."

The geographical distribution of this ore is of curious interest. In the Geology of Pennsylvania, Vol. II, page 504, we read that it does not occur north of Redstone creek, while south of this it is of great economical importance, being the principal source of supply for a number of furnaces. I have been informed by Hon. F. H. Peirpoint, of Fairmont, in the adjoining county of Marion, who is engaged extensively in mining the Pittsburgh coal, that the ore is not visible at that point, only twenty miles south of our line of section. It would be interesting to determine the cause of this limited distribution of the ore, while the shale is persistent.

Thickness, about *fourteen* feet.

UPPER COAL MEASURES.

1. *Coal No. X.—Pittsburgh Coal.*—This is the most important bed on the line of section. It has long been identified with the Pittsburgh coal,

which underlies an area of least twenty-two thousand miles, and everywhere, excepting, possibly, in Kentucky, it is of workable thickness. This bed is usually double, the lower bed consisting of pure coal, and the upper of alternate layers of coal and shale. The beds are generally together, though sometimes distinctly separated. The double character is well displayed on Scott's run, where the following section was obtained near Haigh's mill.

1. Coal	10 feet	0 inches.
2. Shale	1 foot	5 "
3. Coal	1 "	3 "
4. Shale	1 "	9 "
5. Coal	0 "	3 "

East of the Monongahela the coal as opened, about a mile east of Morgantown, differs in its character, for only the lower bed, No. 1 of the section, is present, with, possibly, a part of No. 2. I have been informed by Hon. F. H. Peirpoint, that at Fairmont the upper bed is wanting It would be of interest to examine the seam there at its various exposures, to ascertain whether it is subject to the same changes as at Morgantown.

The strata adjoining this coal offer an equally clear illustration of the rapid changes to be noted in carboniferous rocks. At Morgantown, as also at Fairmont, the bed is overlaid by thin shale, on which rests a heavy stratum of sandstone, coarse grained, with feldpathic sand and some pebbles of quartz. Its stratification is irregular and the material is not compact, so that it frequently weathers into rounded holes. This is a valuable guide to one seeking the coal east of the river, and probably all along the line of strike from Morgantown towards Fairmont, but it disappears somewhere between Morgantown and Scott's run, for at the latter locality the shale is covered by the first of the great limestone series. It is impossible to trace this sandstone east of the river to any distance in the direction of dip, as between its outcrop and the river it has been stripped off by denudation, and the hills are too low to catch it, so that we cannot here determine the point at which the sandstone thins out. The same difficulty occurs west of the river and north of Morgantown, where we might start, at Capt. Sears' opening, where the sandstone is well developed, but our tracing would be interrupted before we could reach the Fairmont road.

This change, both in the coal and in the adjoining strata, has led some of our local geologists to doubt the identity of the seams east and west of the river. There is also a greater distance, by perhaps twenty-five feet, between No. 39, of the lower coal, and this coal west of the river, than between the same strata east of it. The angle of dip is somewhat increased west of the river. The change in structure or thickness of strata can form no basis of argument respecting the coal measures, when it is imposible to obtain two sections, one hundred yards apart, which will be identical. The only cause for doubt lay in the fact that between No. 39, of the lower coal, and this coal, the strata are all concealed east of the river. There is, however, no coal west of the river that can be equivalent to that on the east, except it be the Pittsburgh, and the angle of dip would continue the latter until it made its connection with the former. East of the river there are no exposures of the superior limestones, but, fortunately, the recent opening made by Capt. S. S. Sears, west of the river, and nearly two miles above Morgantown, affords the necessary data for determining the question, for there the coal, sandstone and limestone appear in proper succession.

The lower bed only has been worked. For the most part it is quite pure and free from iron pyrites, though the quality varies greatly even in neighboring banks. At Swisher's bank, near Morgantown, the coal is very pure, and throughout the greater part of the bed beautifully irised, while at some banks in the vicinity the coal is quite inferior and full of pyrites, and badly mixed with "horseback." Though far inferior to some of the other coals for domestic use, it is the chief source of supply, owing especially to its great thickness and its accessibility. The volatile matter is in sufficient quantity to render this a good gas coal, for which purpose it is extensively mined in adjoining counties. The lower coal of the upper bed is said to be remarkably pure, but is not present in quantity to render it available.

In localities where pyrites are abundant, exposure causes the formation of copperas, beautiful crystals of which may frequently be found in the shales. In some cases the heat produced during this chemical change may induce combustion, and doubtless there have been instances in which it has done so. Just beyond Haigh's Mill the strata give such abundant evidence of having been at some time subjected to the action of fire that the locality is known as "Burned Hill." This phenomenon may have been produced in the manner referred to, or, although there is no reason to believe so, it may have been the work of the aborigines.

Shale No. 2, of the section at Haigh's Mill, contains numerous indistinct vegetable impressions, among which the best preserved are the leaves of *Neuropteris hirsuta* and a *Cordaites.*

The eastern outcrop of this bed, west of Laurel Hill, is on the dividing ridge between Cheat river and Decker's Creek, about four miles east of Morgantown. It is not visible on the east side of the river below that village, but is seen on the west side from Granville down. On our line it finally dips under Scott's Run at the "fill," with a dip from its easterly outcrop of not more than one hundred feet to the mile.

Thickness, from *seven* to *fourteen* feet.

2. *Sandstone.*—Already described.

Thickness from nothing to *thirty-five* feet.

3. *Shale.*—Best exposed on Scott's Run. Argillaceous, gray, disintegrating readily upon exposure, and containing near the top some small nodules of iron ore.

Thickness from *five* to *twelve* feet.

4. *Limestone.*—This is the first of a series of limestone strata usually found more or less developed above the Pittsburgh coal. Towards the northern and western portions of our coal field they attain an enormous development, reaching at Wheeling an aggregate thickness of one hundred and fifty feet in little more than four hundred feet of strata; while in the southern portion of our State, along the Kanawha, they have lost their distinctive character and we find in their stead only calcareous shales. On Scott's Run the thickness is about ninety feet.

Though examined in many localities, both in Pennsylvania and West Virginia, these limestones were never known to yield a fossil until last summer, when Mr. Meek, while at Wheeling, discovered what appeared to be a specimen of *Spirorbis,* and another having some resemblance to *Pupa.* With the exception of these two none have been found, and the whole series appears to be non-fossiliferous. The strata are usually compact with a conchoidal fracture, varying in color, blue, yellow or nearly black, and sometimes are in layers separated by thin calcareous shales. This stratum, No. 4, as exposed at Haigh's mill and at the "fill," is blue or gray, of fine grain, compact and with conchoidal fracture. It occurs in three layers separated by thin shale and fragmentary limestone.

Thickness *ten* to *twelve* feet.

5. *Coal No. XI—Redstone Coal.*—This coal is seen at but few points along the section, and at no point has it been extensively worked. It is best exposed at the old Boyer's opening, in a small stream emptying into Scott's Run on the right, a little above Haigh's mill, and at Stumptown, where it may be seen in the bed of the run, as well as on the bank under Berry's wagon shop. Not being readily accessible, the importance of this bed has been greatly underrated, as all points, where examined, the coal is pure and in high repute for smith's use. A number of years ago, it was mined for this purpose above Boyer's old opening into the Pittsburgh coal, near the mouth of Scott's Run. But the locality was not very accessible and it has been worked very little for several years. Although the openings are now concealed, and we can judge for ourselves only by the outcrops, yet there can be no doubt as to its quality.

As the Redstone coal, this has been traced through Ligonier Valley and to the Mt. Savage basin in Pennsylvania, where it appears to be fourteen feet thick. It thins out rapidly towards the west until at Wheeling it presents an outcrop of only five inches. At one point on our line, a thin bed of shale interposes between the coal and the succeeding limestone.

Thickness, between *four* and *five* feet.

6. *Limestone.*—In two layers. The lower is reddish, readily disinte-

grating upon exposure. It is very impure, sometimes with earthy fracture, and contains nodules of iron ore. The upper layer is not persistent in its difference, but where found distinct is purer, of gray color, fine grain, and does not disintegrate upon exposure.

Thickness, *eight* feet.

7. *Limestone.*—Not properly one stratum. The lower layer is apparently good limestone, gray, of fine grain and conchoidal fracture; this is succeeded by shale, that by limestone of not very good quality, and this in turn by shale. The different layers are somewhat irregular in thickness, and cannot be distinguished readily everywhere.

Thickness, *fourteen* feet.

8. *Sandstone.*—Gray, of moderately fine grain, and containing some mica. Where it assumes any considerable, some portions may supply good building material. As exposed on Scott's run, it is about *four* feet thick. At other localities the thickness is much greater, and on the small stream emptying into Scott's run above Haigh's mill, it is *ten* feet.

9. *Limestone.*—Gray or blue, fine-grained, very compact, and with conchoidal fracture. Along Scott's run, its weathered surface is yellow, but this character is not constant. It occurs in layers, from a few inches to a foot in thickness.

Thickness, from *seven* to *nine* feet.

10. *Shale.*—Argillaceous, dark brown.

Thickness, *five* to *eight* feet.

11. *Coal No. XII.—Sewickly coal.* In some respects this is as important as the Pittsburgh coal, and fortunately the numerous openings along Scott's run afford excellent opportunity for thorough examination. It has been opened on Newkirk's farm, on the small stream emptying into the run above Haigh's mill, near to and opposite the salt works near Cole's saw mill, and at other localities farther up the run. In all of these openings the bed showed the same general characteristics, though varying somewhat in thickness.

It is usually separated into two parts by a thin layer of splint coal, sometimes irised and occasionally containing fragments very nearly approaching cannel coal. The lower layer is compact, and though containing a little iron pyrites, is admirably adapted for domestic use, as it neither cakes when burning nor disintegrates upon exposure. The upper layer is less compact, more bituminous, and, so far as observed at several openings, is entirely free from pyrites. It is a good coal for smiths' use, and would doubtless make good coke. The purity of this upper layer derives additional importance from its proximity to the extensive deposit of iron ore just below the Pittsburgh coal.

Like the Redstone coal, this thins out toward the west. In the Savage mountain coal basin (Pennsylvania), it is twelve feet above the Redstone, and there it appears to attain its greatest thickness. On our line the extreme distance between them is about fifty feet, and at Wheeling, where this seam shows an outcrop of only six inches; the two seams are twenty-five feet apart.

Thickness varies from *four* feet *eight* inches to *five and one-half* feet.

12. *Shale.*—Argillaceous, in some localities arenaceous, gray or blue, of fine grain and distinctly laminated structure. It contains imperfect impressions of plants.

This structure varies greatly in thickness. At Newkirk's, at least ten feet are exposed; at one or two openings along Scott's run it is nearly twenty feet thick, while at the opening on the little run above Haigh's mill it varies from six inches to one foot.

Thickness, from *six* inches to *twenty* feet.

13. *Sandstone.*—Flaggy, micaceous, rather compact and light gray color.

Thickness, *eleven* feet.

14. *Shale.*—Argillaceous, of various colors. Its upper layers run gradually into the stratum above.

Thickness, *twelve* feet.(?) Not well disclosed.

15 *Limestone with Shale*—The lower limestone appears to be purer than the upper, which is blue and yellow; in parts disintegrating rapidly on exposure to the atmosphere, while elsewhere, it resists all action.

Thickness, not less than *eight* feet.

16. *Sandstone and Arenaceous Shales.*—Thickness, *ten* feet.

17. *Limestone.*—Generally of light-drab color, of fine grain and irregular fracture. It has every appearance of hydraulic limestone, and would probably prove a valuable source of cement. It is visible along the left bank of the run for a considerable distance, and runs under a short distance east of Colonel Simpson's house.

Thickness, *seven* feet.

18. *Sandstone.*—Shaly below, but compact for two or four feet on top.

Thickness, *fifteen* feet.

19. *Limestone.*—Impure, gray, yellow on weathered surface. It was seen at only one locality along the bank of the run, about one hundred feet beyond the point at which No. 17 disappears.

Thickness, about *six* feet.

20. *Shales.*—Argillaceous, though with a considerable proportion of arenaceous material; grain fine, color bluish. From this point until we reach the next bed of coal the strata are not well exposed, and can be seen in succession only in a small gully opening into the run on the left, a little east of Colonel Simpson's residence.

Thickness of No. 20, *ten* feet.

21. *Sandstone*—With perhaps other strata. Too concealed for determination.

Thickness, perhaps *twenty-five* feet.

22. *Limestones*—With thin layers of *shale.* The strata of limestone are of all varieties, from very impure with dull, brownish color, earthy

fracture and dendritic markings, to pure, of fine grain, blue color, regular fracture and ringing sound when struck. The shales are for the most part soft and readily disintegrating, so that it is difficult to determine their character. Perhaps two-thirds of the whole thickness is limestone. Owing to poor disclosure, it is impossible to define the limits of the various layers, or to describe their characteristics with any degree of accuracy.

Total thickness, not far from *thirty* feet.

23. *Shales and Sandstone*—The shales are well exposed, but appear to contain iron ore. The sandstone is very coarse and of dark red, where freshly broken. On its weathered surface it is very dark brown.

Thickness, about *fifteen* feet.

24. *Shales.*—Gray to yellow; readily disintegrating. At the outcrop they are reduced to mud, and nothing definite can be said about them.

Thickness, *four* feet.

25. *Limestone.*—Compact, gray, fine grain and conchoidal fracture. It resists the action of the atmosphere, but becomes covered with light-colored, nearly white coating. It contains numerous specks of calcspar, and would probably take a fine polish. In this case it would be a rather handsome marble.

Thickness, *five* feet.

26. *Shales.*—Argillaceous, and fine grained, brown, blue to almost black.

Thickness, about *eight* feet.

27. *Sandstone.*—Gray and coarse grained. Not entirely exposed. From the "float rock" I am inclined to think that it contains a thin stratum of very good limestone.

Thickness, probably *fifteen* feet.

28. *Coal No. XIII.*—In respect of size this seam ranks second only to the Pittsburgh coal, and appears to attain much greater development along the line of our section than at any other point of which I am aware. If it be the Waynesburg coal, as is probably the case, its rapid increase in thickness is somewhat extraordinary. The most easterly point at which it is worked, is at the bank or Mr. Aiken, on the top of the hill above Mr. Hoffman's house, on the right and almost opposite the point at which Coal No. XII sinks under the run. At this bank the section is as follows—ascending:

1.	Coal................................	4	feet	10	inches.	Quite good.
2.	Bituminous shale..................	0	"	8	"	
3.	Coal................................	1	"	10	"	Full of iron pyrites.
4.	Shales..............................	1	"	2	"	

No. 2 is very variable, sometimes disappearing entirely, at others becoming even ten feet thick.

At Cassville this seam increases to a thickness of upwards of ten feet, and is commonly known as the "eleven-foot vein." At Tucker's opening the shale No. 2 frequently disappears and leaves full nine feet of coal. The same also occurs at several other banks in the same neighborhood. The coal is usually of very fair quality, though always containing a large proportion of iron pyrites, which sometimes occurs in large nodules. This seam sinks under the run about three-fourths of a mile beyond Cassville.

29. *Sandstone.*—This is gray, siliceous and of such coarse grain that its fragments might be mistaken for those of the conglomerate. Some portions of it yield a building stone of very fair quality. Not unfrequently the upper shales of the coal below assume sufficient importance to rank as a separate stratum, but usually we may regard the stratum as resting directly on the coal.

Thickness, *thirty* to *forty* feet.

30. *Shale.*—Usually argillaceous. Beyond stratum No. 29 no measurements have been made. The rocks are principally sandstone and shales. About *ninety* feet above Coal No. XIII lies *Coal No. XIV*, a thin seam, *one* foot thick, struck by Mr. Lemley while sinking a well on his place at the head of Ramp's hollow, about two miles south of a point on the run, two miles east of Cassville. The coal was of good quality. Four miles beyond Cassville, on a small run, and perhaps two hundred and fifty feet, possibly more, above Coal No. XIII lies *Coal No. XV*, about four feet thick. This seam is worked, but the coal is of poor quality, and the residents in the vicinity prefer to draw their coal from Cassville. Besides these, I know of no coal seams beyond Cassville. There are two strata of limestone, but these are of inferior quality.

ECONOMICAL GEOLOGY.

Coal.—The section just given shows a thickness in workable veins of forty-three feet, all contained between Hagidore's Mill and Cassville, a distance of barely fifteen miles. The seams have a regular dip, and there are few farms, excepting those just east of the Monongahela river, from which coal may not be obtained at moderate cost.

The low coals have been little worked along Decker's Creek owing to the sparse population, and the proximity of the Pittsburgh coal has prevented their use to supply the village. They are, however, of very considerable value, three of them being of workable thickness, and so situated as to be opened with little expense, while one, the Brookville, is so pure that it may perhaps be employed raw in smelting iron.

The upper coals are of such magnitude and of such easy access, that they have all been worked to a greater or less extent. It would be hard to conceive of a section more favored than that lying west of the Monongahela, where, within four miles, all these seams offer many croppings where they can be can be worked. At Boyer's old opening the Pittsburgh and Redstone can both be worked; so, also, at Haigh's opening; and there are several points farther up the river where the Pittsburgh, Redstone and Sewickly are all visible, the one directly over the other. At all of these points the several seams can be opened so as to drain themselves, the coal could be delivered directly into cars and conveyed on a tramway to the river, little more than a mile away. The same veins are visible to a greater or less extent along the river bank below Scott's Run, but cannot as advantageously there, as the dip is towards the northwest and the mines would have to be drained with pumps.

The amount of coal mined is very small. From the Pittsburgh seam about 5,000 tons are taken out to supply Morgantown. It is barely possible that 2,000 tons are taken from all the other seams. There can be no doubt, that were there an accessible market, the coal mines of Monongalia county would soon assume as important a position as those of the neighboring counties of Pennsylvania, where the same coal seams are worked.

Iron.—Iron ore is plentifully distributed thoughout the lower coal measures, and valuable beds underlie the conglomerate. West of Cheat river no effort has been made for twenty-five years to work these ores, and the failure of several furnaces east of that river has discouraged all attempts there for nearly the same length of time. There can, however, be no douht, that were there any means of conveying the products to market, furnaces could be worked profitably on Decker's and Booth's Creeks, as well as at several points on or near Cheat river. The ore beds beneath the conglomerate are practically inexhaustible, and the deposit underlying the Pittsburgh coal has been worked to great profit at several furnaces in Pennsylvania, while in the lower coal measures, as exposed on Decker's Creek, there are several beds, of various degrees of purity, which have proved available.

Lead.—Small quantities of galena have been found both in this county and Preston. There are traditions to the effect that the Indians formerly worked a mine of this ore, and that frequently they were seen in possession of it. That they had specimens of this mineral is highly probable, for, aside from the fact that it is known to occur here in small quantities, it was a medium of exchange among the savages; but there is no evidence that they ever obtained any considerable amount of it here; it might, indeed, have come from Illinois. Though not by any means impossible, the existence of large quantities of galena in this county is not sufficiently attested to warrant belief.

Gold.—The presence of this metal has been suspected. Upon slender indications a company was formed in Philadelphia to work in the northwest portion of the county. After expending nearly $100,000 the company abandoned the project. *Silver*, also, has been sought, but without success. There is little reason to believe that either of these metals will be found here.

Limestone.—Along the whole line of section limestone is abundant. None of the coal measure strata, excepting perhaps No. 4 of the upper coal measure, affords a fine white lime, though for the most part they yield material good enough for the coarser work and for agricultural purposes. The Lower Carboniferous limestone contains some layers, especially towards its base, which burn into a pure white lime. This does not always retain its whiteness upon slacking. Several of the strata yield a good hydraulic lime. That from one lying a short distance below the Pittsburgh coal has been used on the Baltimore & Ohio Railroad near Fairmont. The shales connected with the limestone series of the upper coal measures are frequently so calcareous as to be true marls.

Firestones.—There are two strata of sandstone near the base of the coal measures which yield very refractory materials for furnace hearths.

Clays and Sands.—The alluvial clays and subsoils generally supply material for the manufacture of pretty good bricks, and many houses are constructed of brick made from clay obtained from the excavation. Some blue clay, obtained from a well sunk on the premises of Mr. Keck, has been tried at the Morgantown pottery and found to answer very well for coarse ware. No tests have been made of the fireclays found in connection with the coals below the Mahoning sandstone, but at least one of them will prove valuable.

The alluvial sands are of good quality for mortar, and several layers of the more friable sandstones of the conglomerate are white enough for the manufacture of ordinary glassware.

Salt.—In nearly every instance where the conglomerate has been bored brine has been obtained. Such borings have been made on Cheat river at the mouth of Quarry Run, on Decker's Creek near Hagidore's Mill, on Scott's Run near Stumptown, and on the Monongahela below Scott's Run. These borings were made for oil, and as the companies were unsuccessful, no attention was paid to the salt except on Scott's Run. The brine struck in the first two borings was strong and of good quality. The Decker's Creek well still flows, but the tubing has been removed and the brine is mixed with fresh water, struck one hundred and fifty feet below the surface, so that an analysis of the brine is impossible. Mr. Guseman, and others residing in the vicinity, made some salt before the tubing was removed, but their memoranda have been lost, and I have been unable to gain any positive information further than that the salt was of excellent quality. Salt works were erected on Scott's Run, but for some reason they were abandoned, and the well is now choked up.

No fair test has yet been made of these brine reservoirs, but the prospect is sufficient to encourage experiment.

Petroleum.—Efforts have been made frequently to find oil, but not always with judgment. Those on the west side of the Monongahela had to sink six hundred and fifty or seven hundred feet before reaching the conglomerate. Oil was obtained in non-paying quantities from the wells on Decker's Creek and Cheat River. There is no doubt that borings made in the gap of either Cheat river or Decker's Creek would be as likely to find oil as those made anywhere, for these are the lowest points in the county. Patient boring and large expenditure of money at these points, would, at least, give results of scientific value which cannot be said of all localities.

Water.—There is an abundant supply. The tributaries of Cheat and Monongahela rivers intersect the county in almost every direction. Water for domestic purposes can be obtained with ease in wells, and excellent springs are found on nearly every hill. Chalybeate springs are numerous throughout the lower coal measures.

Soil.—For the most part, along the creeks and rivers, the subsoil is a heavy clay, while the soil is thin. East of the Monongahela it is not very rich, though fair crops of grain have been obtained. West of the river the soil improves, becomes deeper, and, owing to the large proportion of lime present, better adapted to grain-raising. It is impossible to give any statistics respecting the crops, as no records have been kept. Agricultural fairs are yet a novelty and they have not received the encouragement from farmers which they deserve.

While, as already stated, fair crops of grain can be obtained, it is abundantly evident that grain-raising is not the best use to which the soil can be put. The soil here is not permanently rich, and to preserve its fertility continued manuring is necessary. Hilly countries like this are best fitted for stock-raising. As blue grass grows richly here this is a profitable business. It is largely followed in neighboring counties, and should be the chief employment here.

Timber.—This is found of good quality and in vast quantity. The only outlet is the Monongahela, which is a very uncertain one.

Manufactures are still limited to such articles as can be made with little trouble and at much less cost than if imported. They are principally lumber, bricks, potters' wares, flour and coarse woolen goods.

Water Power to an unlimited extent is provided by all the streams. The fall is very rapid, and mills could be established in close proximity to each other.

PALAEONTOLOGY.

Owing to the fact that the section already given was made chiefly by myself, and at such times as I could best spare from other and more pressing duties, no very careful search for fossil remains was made. No collections were obtained from the main portion of the Lower Carboniferous Limestone, and the species enumerated in the list were obtained from the extreme top, and some from the red shales of the same formation. Only three fossiliferous strata have been discovered in the lower coal measures, and but one in the upper. No collections of plants have been made, though numerous species may be found in the lower coal measures.

All the specimens obtained were forwarded to Mr. Meek, for identification. The list is given hereafter, together with descriptions of five new species. Mr. Meek expresses his conclusions in the following letter:

WASHINGTON, D. C., *November* 8, 1870.

Prof. STEVENSON:

DEAR SIR:—I have examined the carboniferous fossils, sent by you from West Virginia, with as much care as other engagements would permit. Of those from the lower carboniferous limestone of Monongalia county, there are about seventeen species. Most of these, however, I have not been able to identify with known forms, owing mainly to the imperfect condition of the specimens. A few of them, however, may be found to be new species, when better specimens can be examined. Six or seven of the species are forms found in the great upper division of the lower carboniferous limestone series of the Western States—the Chester Group of the Illinois Reports. Some of the others will probably also prove to be Chester species; while one (*Hemipronites crassus*) has not before, I believe, been found below the coal measures, through the whole of which it ranges farther westward. It is likewise worthy of note that another form (a short, rapidly expanding *Cyrtoceras*,) is most nearly like a western coal measure species, while there is also among the specimens an imperfect example of a *Bellerophon*, marked very like *B. carbonarius* of Cox, from the coal measures.

From all the evidence yet obtained, I can arrive at no other conclusion than that this [portion of the] Monongalia limestone belongs to the horizon of the Chester Group. Six or seven of the species are, as already indicated, certainly Chester forms, while several others are either identical with Chester species, or most nearly related to forms of that age. The fact that one of the species is also known to range through the whole of the coal measures, and one or two others are nearly related to forms of that age, rather confirms the conclusion that this rock belongs to the horizon of the Chester Group than otherwise, especially when the species are viewed in connection with their associates; for it is now well known that some of the coal measure types of the West have, as might be expected, closely allied representatives in the Chester Group, while several Brachiopods are known to range from below the Chester Group into the coal measures.

So far as I am informed, this is the farthest point to the eastward at which the Chester Group, or indeed any other particular division of the lower carboniferous limestone series of the West, has been yet recognized.

The specimens sent from the lower coal measures are nearly all forms common in the coal series of Indiana, Illinois, Missouri, Kansas, Nebraska, etc., though few of them have before been found so far eastward. In some of the States mentioned, nearly all of these species range through the whole of the coal measures. Some of them, however, are locally more restricted. This great range of the species of invertebrate remains in the coal measures of the Western States has long since satisfied me that these fossils cannot generally be relied upon as a means of identifying particular beds or horizons in our coal measures throughout wide areas; though particular groupings of species may sometimes serve as guides in this respect, within limited areas. The coal measure forms, however, enable us at once to distinguish beds of that age from any of the lower carboniferous or older rocks.

The great length of time through which most of these fossils must have continued to live, will be better understood when it is stated that nearly *all* of the species enumerated in this list from the lower coal measures of West Virginia, also occur even in the upper coal measure beds in Nebraska, referred by Professors Marcon and Geinitz to the *Permian* or so-called *Dyas.** Indeed, the collections from these two widely separated localities and horizons, contain so many of the same species, that if shown to almost any geologist unacquainted with the range of species in our coal measures, he would scarcely hesitate to adopt the conclusion that they came from *exactly* the same horizon in the series. Yet from what is known of the geology of your region, and of that of the States farther west, it is probable that the beds from which your collections were obtained, hold a position from 1,000 to 1,500 feet or more below those alluded to in Nebraska.

From such facts as this, it would seem that although there were many elevations and depressions, as well as other consequent changes, the climatic and other physical conditions affecting animal life, must have remained remarkably uniform throughout the whole of the long-continued coal period.

Very truly yours,

F. B. MEEK.

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*I have marked with an asterisk in the list, each of the species known to occur, with numerous other carboniferous species, in the so-called *Dyas* of Nebraska.

LISTS OF CARBONIFEROUS FOSSILS FROM WEST VIRGINIA,

MADE OUT BY F. B. MEEK.

A, LOWER CARBONIFEROUS (CHESTER GROUP) SPECIES.

1. Monticulipora.—[All the lower carboniferous species were obtained on Cheat river, about two miles above Ice's ferry.—J. J. S.]

2. Crinoidal Columns.

3. Hemipronites Crassus. Meek and Hayden.—The specimens seem to agree in all respects with this coal measure form, which I had been led to suspect might be *H. crenistria,* Phillip's sp. Mr. Davidson, however, to whom I sent specimens of it, says: he has never seen in the species "*crenistria*" the peculiar mesial septum seen in the ventral valve of *H. crassus.* The same septum is seen in the specimens here under consideration.

* 4. Productus Fasciculatus. McChesney.—This may be only a variety of *P. elegans.* Norwood and Pratten.

* 5. Productus Pileiformis. McChesney.

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* Specimens marked with an asterisk in list A are identical with forms occurring in the Chester group in the Western States.

*6. Athyris Subquadrata. Hall.—The title of this to rank as a distinct species from *A. subtilita* may be questionable.

7. Spirifer Keokuk var. Hall. (?)—Seems also to be near *S. opimus*, Hall, from the coal measures.

*8. Pinna. Undt. sp.—Fragments of a longitudinally-ribbed species that is very like *P. Missouriensis*. Swallow. It occurs in the Chester group in Illinois, Missouri, etc.

9. Modiola, or Myalina.—Probably new.

*10. Allorisma Clavata. McChesney.—(*A. antiqua*. Swallow.)—This is a very variable species, and is often so distorted by accidental pressure as to present widely different forms.

11. Allorisma. Undt. sp.—Along with *A. clavata* are numerous specimens which differ so widely from it, and from each other, that I am inclined to think there are among them two or three other variable species. But I have not had time to study the series with sufficient care to be able to decide on this point.

12. Macrocheilus. Undt. sp.

13. Naticopsis. Undt. sp.

14. Bellerophon. Undt. sp.—Probably two or more species, one of which is most nearly like *B. carbonarius* of the western coal measures.

15. Pleurotomaria. Undt. sp.

*16. Straparollus Planidorsatus. Meek and Worthen.

(—Euomphalus Perspectivus. Swallow.)

17. Cyrtoceras. Undt. sp.—Seems to be closely related to *C. curtum*. Meek and Worthen, from the coal measures.

†18. Phillipsia Stevensoni. Meek.

B. LOWER COAL MEASURES SPECIES.

*1. Crinoidal Fragments.—Some pentagonal, star-shaped discs of columns. [Stratum No. 29.]

2. Crinoidal Columns.—[Strata Nos. 20 and 29.]

3. Erisocrinus. Undt. sp.—[Stratum No. 20.]

4. Hemipronites Crassus. Meek & Hayden.—[Generally distributed.]

5. Chonetes Smithii. Norwood & Pratten.—[Stratum No. 29.]

6. Chonetes.—Seems to differ from *C. granulifera*, Owen, only in being smaller. [Stratum No. 28.]

*7. Productus Nebrascensus. Owen.—[Generally distributed.]

*8. Productus Prattenanus. Norwood.—[Generally distributed.]

*9. Productus Semireticulatus. Martin sp.—[Stratum No. 29. Seems to be rare in our beds.]

10. Productus. Undt. sp.—Very small, concentrically wrinkled. [Stratum No. —.]

*11. Athyris Subtilita. Hall.—Very abundant and presenting all the usual varieties. [Of general distribution.]

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† Species marked with a dagger are new species, of which descriptions are at the end of the lists.

*12. Spirifer (Martinia) Planoconvexus. Shumard.

*13. Spirifer Cameratus. Morton.

*14. Discina Nitida. ?—[Stratum 28.]

*? 15. Psuedomonotis—(Monotis of some authors, but not of Brown.)—A fragment, but showing exactly the irregular radiating costæ and striæ, with vaulted scales on the ribs, seen in that genus. [29.]

*16. Aviculopecten Carbonarius. Stevens, sp—Pecten Broadheadii, Swallow & P. Hawni, Geinitz. [20 and 29.]

17. Aviculopecten. Undt. sp.—Probably *A occidentalis*. Shumard.

*18. Myalina Subquadrata. Shumard, var. ampla.—[Stratum 29.]

19. Myalina. Undt. sp.—Very small, probabaly a young shell. [Stratum 28.]

20. Allorisma. Undt. sp.—[Stratum 29.]

21. Allorisma. Undt. sp.—[Stratum 20.]

*22. Nucula Ventricosa. Hall.—[Strata 20 and 28.]

*23. Nucula Parva. McChesney.—[Stratum 28.]

†24. Nucula Anodontoides. Meek.—[Strata 20 and 28.]

*25. Nuculana Bellistriata. Stevens sp.—A very small attenuated variety. Common in the so-called upper Dyas, Nebraska City, Nebraska. [Strata 20 and 28.]

†26. Yoldia Carbonaria. Meek.—[Stratum 20.]

†27. Yoldia Stevensoni. Meek.—[Stratum 20.]

*28. Schizodus. Undt sp.—[Stratum 20.]

*29. Edmondia Aspenwalensis. Meek.—[Stratum 20.]

30. Astartella. Undt sp.—[Strata 20 and 28.]

†31. Macrodon obsoletus. Meek.—[Stratum 28.]

32. Macrocheilus Primigenius. Conrad.—[Strata 20 and 28.]

*33. Macrocheilus Ventricosus. Hall.—[Strata 20 and 28.]

34. Macrocheilus. Undt. sp.—[Strata 20 and 28.]

35. Polyphemopsis. Peracutus. Meek & Worthen.—[Stratum 20.]

*36. Euomphalus rugosus. Hall, not Sowerby.—[Stratum 20.]

*37. Bellerophon Montfortianus. Norwood & Pratten.—[Strata 20 and 28.]

*38. Bellerophon Percarinatus. Conrad—[Strata 20 and 28.]

*39. Bellerophon Carbonarius. Cox.—[Strata 20 and 28.]

40. Bellerophon Meekianus. Swallow.—[Strata 20 and 28.]

*41. Pleurotomaria Grayvilliensis. Norwood & Pratten.—[Strata 20 and 28.]

42. Pleutomaria. Undt sp.—A very small, depressed species. [Stratum 28.]

*43. Orthoceras Cribrosum. Geinitz.—[Strata 20 and 28.]

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* The species marked with an asterisk in list B, are known to range through the whole of the coal measures in the West, even into the upper beds at Nebraska City, Nebraska, referred by Profs. Marcon and Geinitz to the Permian, or so-called Dyas.

† New species. The descriptions will be found at the end of the lists.

*44. Nautillus Occidentalis. Swallow.—[Strata 20 and 28.]
45. Nautilus. Undt sp.—[Stratum 28.]
*46. Phillipsia Sangamonensis. Meek & Worthen.—[Stratum 20.]

UPPER COAL MEASURE SPECIES.

1, Solenomya. Undt sp.

DESCRIPTIONS OF NEW SPECIES.

By F. B. Meek.

December, 1870.

MACRODON OBSOLETUS—*Meek.*

This species agrees very nearly with *M.* (*Arca*) *carabonaria* of Cox, (Kentucky Report, Atlas pl. VIII, fig. 5,) excepting that it seems not to attain quite so large a size, and has radiating costæ only on the posterior dorsal region; all the other parts of the valves being marked merely by concentric lines, and sometimes rather strong, irregular ridges and furrows of growth. These concentric striæ cross the radiating lines of the posterior dorsal region, so as to form a subcancellated marking on that part of the valves.

Length, 1 inch; height 0.45 inch; convexity, about 0.26 inch.

Locality and position—lower coal measures of Monongalia county, W. Va.

NUCULA (?) ANODONTOIDES.—*Meek.*

Shell ovate, ventricose, the greatest convexity being in the umbonal region; posterior side short, faintly sub-truncate vertically at the immediate extremity; basal margin semi-elliptical in outline; cardinal margin nearly straight externally, equaling about half the length of the valves, carinate at the extremities; anterior side rather long, very narrowly rounded in the middle of the extremity, to which point the basal margin rounds up rather gradually, and the anterior dorsal edge slopes obliquely from the end of the hinge; beaks moderately prominent, convex, incurved without very distinct obliquity, and located about half-way between the middle and the posterior side; umbonal slopes, both before and behind, sub-angular, in consequence of the presence of a lunule and escutcheon-like impression, of which that on the anterior or longer side is larger, being usually continued nearly or quite to the extremity of that side. Surface smooth, or only showing under a magnifier very obscure lines of growth.

Length of the largest specimen, 0.57 inch; height, 0.40 inch; convexity, 0.30 inch. Some of the other specimens are proportionally more convex.

I have described the shorter side as the posterior of this shell, which, of course, would probably be incorrect, if it is not a true *Nucula*. Although I only know from some of the imperfect specimens, that it has a rather coarsely crenate hinge, there can be little doubt that it has an internal ligament, and thus differs from *Tellinomya* and other palaeozoic types that have been separated under other names, since the dorsal margin of the valves can be seen to fit closely all the way along, so as to show no traces of an external ligament. It has not the physiognomy of the typical modern *Nuculas*, but looks externally like a miniature *anodon*. It seems to be *closely* allied to *N. Beyrichi*, V. Schaur, from the Permian of Germany; but it is larger, more robust, more nearly smooth, and differs in the lunule-like impressions before and behind the beaks.

Locality and position.—Just below the Mahoning sandstone, Monongalia county, W. Va. Coal measures.

YOLDIA STEVENSONI.—*Meek.*

Shell much compressed, very thin, longitudinally elliptic-subovate, being about twice as long as high, with the widest part a little before the middle; anterior side narrowly rounded; posterior more contracted and compressed, with the extremity faintly truncated above the middle; basal outline broadly semi-ovate, being a little more prominent anteriorly; cardinal border sharply carinate, and provided with a marginal furrow on each valve, both before and behind the beaks, slightly convex before and concave behind the beaks, in outline; umbonal slopes not angular; beaks nearly central and depressed. Surface ornamented by fine, regular, concentric, linear furrows, separated by spaces two or three times their own breadth.

Length, 0.78 inch; height, 0.38 inch; convexity, 0.16 inch.

A very neat, remarkably compressed species, having exactly the form and external appearance of a true *Yoldia*, but its hinge and interior are unknown. Named in honor of Prof. J. J. Stevenson, of West Virginia University.

Locality and position.—Dark shale just below the Mahoning sandstone, Monongalia county, W. Va. Coal measures.

YOLDIA CARBONARIA.—*Meek.*

This species is much more convex than *Y. Stevensoni*, as well as proportionally longer, particularly behind the beaks, while its anterior end is shorter and more narrowly rounded, and its posterior dorsal slope is straighter and more declining to the narrowly rounded extremity. Its dorsal border also wants the carinate and the marginally sulcate character of that species, and its surface the regularly sulcate ornamentation, being marked merely with very obscure irregular lines of growth. Its beaks are more convex and proportionally farther forward than in *Y. Stevensoni.*

Locality and Position.—Dark shale just under the Mahoning sandstone of the coal measures. Monongalia county, W. Va.

PHILLIPSIA STEVENSONI.—*Meek.*

The only specimens of this species obtained consist of a part of the glabella and the pygidium. The latter is very similar to the corresponding part of *P. Portlockii*, M. & W. (hoc. Acad. N. S., Philad., Dec., 1865, p. 268) from the Keokuk beds, excepting that it is proportionaly longer, more convex, and more narrowly rounded behind; its length and breadth being very nearly or quite equal, and its height half the breadth. Its lateral lobes also slope more abruptly to the margins, which are not flattened, but very slightly thickened, obscurely striated, and abruptly sloping. It likewise shows no traces of either the furrows or granules seen on the anterior segments of the lateral lobes of *P. Portlockii*, the surface of these lobes being entirely smooth, excepting minute pitting or punctures. Its prominent mesial lobe is flattened or slightly furrowed on each side, and shows fourteen segments, ornamented each by a row of small granules; while each lateral lobe has ten less strongly defined, and more depressed segments, separated merely by slight linear furrows.

The fragment of a glabella, found associated with the pygidium, above described, shows it to be rather depressed, oval-oblong, widest between the eyes, with a comparatively large sub-trigonal posterior lateral lobe on each side, extending forward to about the middle of the inner margin of each of the small palpebral lobes; and just before each of these larger lateral lobes there is another faintly defined, very small, oblique one, not extending quite so far forward as the palpebral lobes. The neck segment is comparatively wide antero-posteriorly, arched upward nearly or quite as high as the central part of the glabella, and, like the latter, ornamented by small granules.

Length of pygidium, 0. 32 inch; breadth, 0. 33 inch; height, 0. 16 inch.

Named in honor of Prof. J. J. Stevenson, of West Virginia University.

Locality and Position.—Monongalia county, W. Va. Chester group of the Lower Carboniferous.

[I am under obligations to Col. W. A. Hanway, H. W. Brock, M. D., Messrs. D. H. Chadwick and E. Chisler, of Morgantown, and to Mr. John W. Guseman, on Decker's Creek, for assistance in collecting fossils and making measurements. I am also indebted to Mr. Moses D. Wells, of Morgantown, for information upon some points of our local geology, which I have already acknowledged in the body of the report.—J. J. S.]

"C"

Rev. Alexander Martin, D.D.,

President of West Virginia University:

Sir:—I have the honor to submit the following report of the Military Department, for the academic year ending June 16, 1870:

For reasons to be explained, I shall confine myself almost exclusively to the Corps of State Cadets.

Previous to scheduled statements, permit me to direct your attention for a moment, to the past and present condition of the Corps, and to offer a few suggestions for the future.

In accordance with special orders No. 57, dated Headquarters of the Army, Adjutant General's Office, Washington, June 30th, 1869, I assumed charge of this Department at the commencement of the Fall term, September 7th, 1869.

It was apparent at the outset that, in a military sense, matters connected with the Department were in a "demoralized" condition.

Outside the cadets, upon whom the drill was obligatory, few students engaged in the exercises. A general spirit of indifference prevailed.

There was a lack of oganization, discipline and soldierly pride; consequently, there was an absence of every element of success.

So far as appearances indicated, the military system had come far short of producing its legitimate results.

In speaking thus plainly, I would not, by any means, detract from the merits of my predecessor. I believe him to have been an earnest, competent gentleman; eminently qualified to fulfill the duties of his position.

The failure, in this instance, rested entirely in the fact that too much was expected from the voluntary action of the students themselves. As a natural result, as soon as the novelty of drill ceased, the entire system fell into disrepute.

It is exceedingly difficult, if not impossible, to make good soldiers of un-uniformed recruits, more especially when no definite system of regulation exists.

I need scarcely assert that it has been no easy task, under the circumstances, to remedy existing evils, and to place matters upon anything approaching a proper military footing. So far as the State Cadets are concerned, I take much pride in claiming that this has been, in a considerable degree, accomplished.

Early in the year the Cadets were organized into an entirely separate corps, officered exclusively from their own number. The officers were carefully selected, duly commissioned under the established seal of the

University, and their duties and responsibilities accurately defined. Ready obedience to proper authority, promptness on duty, accuracy in drill, and scrupulous neatness of clothing, arms and equipments, were strictly required. The result has been more than encouraging. In the above essential points the corps can scarcely be excelled. A just spirit of pride, in the reputation of the corps, animates each Cadet. It is not too much to affirm that, in regard to scholarship, gentlemanly deportment and correct and soldierly bearing, the Cadets have exercised a marked and increasing influence over the entire body of students during the past year.

In view of this desirable state of things, too much commendation cannot be given to those high-minded young gentlemen who have, under many discouraging circumstances, maintained their positions in the corps; and, by patient, constant effort, materially aided in elevating it to the present standard. I say *discouraging circumstances*, for the present allowance, in a pecuniary sense, is barely sufficient to remunerate them for the necessary wear and tear of clothing attendant on drill,—by no means equaling the amount granted similar organizations in other States. Besides, there has been a deplorable want of proper appointments to render the exercises effective and complete. Prominent among these deficiencies, permit me to mention the absolute need of a suitable *armory building* in which to secure the ordnance and ordnance stores, together with other valuable property, from damage and loss. Aside from the positive benefit that a small appropriation for this purpose alone, would confer upon a corps, which, if reasonably encouraged, is destined to become an honor to the Commonwealth, I deem it poor economy to defer action in the matter. Many thousands of dollars' worth of valuable stores are exposed to loss, by reason of inadequte accommodations. I feel it a duty to urge upon the Regents, through you, Mr. President, the pressing necessity for a timely and liberal consideration of this and other subjects connected with this important department of the University.

There are many other interests and suggestions proper to be presented in this connection, which I beg leave to embody in a system of regulations, to be submitted at the next annual meeting of the Board of Regents.

The cadets have been regularly, carefully and systematically drilled during the year in the tactics of the three arms of the service. Theoretical and practical instruction has been given upon the subjects of gunnery and military engineering as applied to field fortifications. In short, the curriculum of instruction, as laid down in the published catalogue of the University, has been, to all intents and purposes, closely followed.

While I have said little in regard to the military system, as applied to the students in general, I would not, by any means, have it understood that they have been neglected, or that they have failed to be benefited thereby. Owing to constant change in organization, attendant upon the volunteer system, and to a lack of soldierly pride attendant upon their un-uniformed condition, but little progress has been made, however, as compared with the State cadets.

I earnestly recommend that all students, belonging to the University proper, be compelled to wear the uniform prescribed for the corps of cadets, and that the matter of drill be made compulsory. Otherwise, the system, as concerns students in general, should, in my opinion, be discontinued altogether.

Music is required to give spirit and tone to the otherwise monotonous exercises of drill. A drum corps has been organized, but, thus far, it has been impossible to secure instruments. I trust that this slight deficiency will be supplied at an early day.

The following inventory of ordnance and ordnance stores is respectfully submitted. I would simply state that no property was invoiced to me at the beginning of the year. The articles specified were found after careful search; many of them in an unserviceable condition. Owing to the absence of an armory and a general lack of order and fixed responsibility, much valuable property has undoubtedly been wasted. Early in the year, Cadet Frank A. Golden was duly commissioned and made responsible for the safe keeping of all ordnance and ordnance stores connected with the University. I take pleasure in testifying to the faithful manner in which he has discharged the duties of his office. The accompanying classified list was arranged by him and is approved.

Inventory of Ordnance and Ordnance Stores for use in the Military Department of West Virginia University, on hand and to be accounted for, June 16th, 1870.

Class I.

No.	Names of Articles.	Condition.
2	3-inch Wrought Iron Guns. Model, 1861	Worn.

Class II.

No.	Names of Articles.	Condition.
2	3-inch Gun Carriages and Limbers	"

Class III.

No.	Names of Articles.	Condition.
2	Sponge Buckets, Iron, for Field Guns	"
2	Tar " " " "	"
2	Water Buckets, Leather	"
2	Fuse Blocks	"
1	Gunner's Pincers	"
3	" Haversacks	"
4	Trail Handspikes, for 3-inch Gun	"
2	Pendulum Hawsers, "	"
2	" " Pouches	"
2	Priming Wires	"
2	Prolouges	"
4	Sponges and Rammers, for 3-inch Guns	"
4	Sponge Covers, " "	"

No.	Names of Articles.	Condition.
2	Tarpulins, large, 12x15	Worn.
2	Thumb Stalls	“
1	Worm, for Field Gun	“
2	Vent Covers	“
4	Tube Pouches	“
3	Lanyards and Hooks	“
2	Vent Pouches	“
2	Tow Hook	“
1	Fuse Wrench	“
2	Tompions for 3-inch Gun	“

CLASS V.

58	Rounds Case Shot for 3-inch Gun; Dyer's Patent	Good.
40	“ Fuse Shell for 3-inch Gun, Dyer's Patent	“
20	“ Pat. Fuse and Percussion Shell, 3-inch Gun	“
20	“ Canister Shot, Hotchkiss' Patent, “ “	“
30	“ Perc. Shell, “ “ “ “	“

CLASS VI.

106	Springfield Rifled Muskets, Cal. .58, Model 1861	Much worn.
48	U. S. Rifles, Sabre Bayonet	“ “
50	Cavalry Sabres, Light American	“ “
5	Non-Commissioned Officers' Swords	“ “
3	Line Officers' Swords, Infantry	“ “
88	Bayonets, Springfield Rifled Musket	“ “

CLASS VII.

46	Sabre Belts, Cavalry	Much worn.
46	“ “ Plates, Cavalry	“ “
143	Cartridge Boxes, Infantry	“ “
51	“ “ Plates, Infantry	“ “
139	Waist Belts, Infantry	“ “
238	“ “ “	“ “
125	Gun Slings	“ “
140	Breast Straps, Infantry	“ “
133	Bayonet Scabbards	“ “
134	Cap Pouches	“ “
7	Ball Screws	“ “
44	Screw Drivers and Cone Wrenches	“ “
3	Spring Vises	“ “
17	Wipers	“ “

CLASS VIII.

13,400	Rds. Elongated Ball Cartridges, Cal. .58	Good.
1,000	“ “ “ “ without Caps	“
10	Yards Slow Match	“
17	Port Fires	“

CLASS X.

300	Blank Forms, various.
6	Quires Letter Paper.
10	Bunches Official Envelopes.
26	Sheets Emery Cloth.
1	Hatchet.
2	Screw Drivers.

The following is a complete Roster of Cadets from the foundation of the University. It has been compiled from the records, after a careful examination.

ROSTER OF CADETS.

District.	Name.	When Confirmed.	History.
First......	J. Plummer, Pittsburgh	Sept. 3, 1867	Honorably discharged.
	John C. Adams............	Sept. 3, 1867	Dismissed.
	Joseph B. Caldwell......	Jan. 9, 1869	Dismissed Oct. 25, 1869
	J. S. S. Woods............	Oct. 29, 1869	Honorably discharged.
	James J. Peterson........	Oct. 20, 1870	Present for duty.
Second...	Israel C. White...........	Sept. 3, 1870	Present for duty.
	John D. Hall..............	Oct. 11, 1867	Honorably discharged.
	E. E. Moran...............	Nov. 30, 1869	Present for duty.
Third.....	James L. Wilson.........	Sept. 3, 1867	Honorably discharged.
	Wm. T. Bowman.........	June 28, 1867	“ “
	John W. Huggins........	Jan. 19, 1869	“ “
	Marcellus L. Temple....	Feb. 4, 1870	Absent with leave.
	Leroy S. Sinsel...........	Nov. 18, 1870	Present for duty.
Fourth ...	Benj. W. Smith...........	June 27, 1867	Present for duty.
	Aaron C. Stewart.........	Mar. 16, 1868	Honorably discharged.
	John S. W. Dean.........	Jan. 8, 1870	Present for duty.
Fifth......	Thornton Lewis..	Aug. 24, 1867	Declined Appointment.
	Walter H. Duval.........	Jan. 9, 1869	Dismissed.
	Chas. A. Foster...........	Jan. 29, 1869	Honorably discharged.
	J. W. Bishop..............	Oct. 11, 1867	Declined Appointment.
	John T. Harris............	Oct. 20, 1870	“ “
	Willey O. Ison............	Oct. 20, 1870	Present for duty.
Sixth......	John H. Drabell.........	Oct. 11, 1867	“ “
	M. H. Dent................	Feb. 15, 1868	Graduated June 16, ’70
	David F. Simmons......	April 8, 1870	Absent with leave.
Seventh..	Wm. M. Paden............	Jan. 9, 1869	Honorably discharged.
	Daniel W. Dix............	Mar. 22, 1869	Present for duty.
	Edgar Polsley............	Sept. 3, 1867	Honorably discharged.
Eighth...	Geo. K. Osgood...........	June 27, 1867	Present for duty.
	Frank A. Golden.........	April 9, 1869	“ “
	Wm. J. W. Teter.........	Feb. 15, 1868	Confirmation revoked.
Ninth.....	George Rider..............	Nov. 21, 1867	Honorably discharged.
	Archibald F. Rader.....	Jan. 9, 1869	“ “
	Wm. M. Howell..........	Feb. 16, 1870	Absent with leave.
	Perry S. Shaffer...........	Dec. 2, 1867	Honorably discharged.
Tenth......	Chas. M. Babb............	Jan. 9, 1869	Present for duty.
	Clarence L. Smith........	Mar. 15, 1869	Honorably discharged.
	James T. Carskadon.....	Oct. 20, 1870	Present for duty.
Eleventh	Gabriel T. Barbee........	Sept. 3, 1867	Honorably discharged.
	Daniel W. Border........	Aug. 24, 1867	Present for duty.
	Wm. A. Pitzer............	Aug. 24, 1867	Honorably discharged.
	Asbury H. Troxell......	Sept. 6, 1870	Present for duty.
	Amby Hinkle........... .	Aug. 24, 1867	Honorably discharged.

The following text-books have been purchased for the use of Cadets during the year. A much greater outlay than usual has been rendered necessary by a frequent change of authors studied in some of the Schools of the University.

List of Text-Books purchased for the use of Cadets during the Academic Year ending June 16th, 1870.

No.	Title and Author.
1.	Latin Lexicon—Andrew's.
1.	Greek " Pickering's
4.	German " Adler's
6.	French " Speer's and Surwer's
4.	Book-Keeping—Smith and Martin's.
4.	American Speakers.
10.	French Course—Fasquelle's.
3.	German Grammars—Ahn's.
1.	" Reader—Ahn's.
2.	Arithmetics—Stoddard's.
2.	Surveying and Navigation—Robinson's.
3.	Horace—Anthon's.
1.	Latin Grammar—Bullion's.
4.	Greek Prose—Arnold's.
3.	Homer's Odyssey—Owen's.
3.	Theory and Practice of Teaching—Page's.
5.	Rhetoric—Whateley's.
8.	Logic—Coppee's.
3.	Greek Grammar.
2.	Herodotus—Johnson's.
5.	Greek Testament.
5.	Classical Dictionary—Anthon's.
4.	Homer's Iliad—Anthon's.
4.	English Literature—Shaw's.
8.	Botany—Grey's.
5.	Telemaque—Fenelon's.
2.	Sixth Reader—McGuffey's.
3.	Constitution of the United States—Story's.
1.	Military Tactics—Upton's.
4.	Chemistry—Roscoe's.
5,	Anatomy—Draper's,
4.	Crito.
1.	Livy—Lincoln's.
1.	Calculus—Loomis'.
2.	Universal History—Webber's.
3.	Latin Prose—Arnold's.
1.	German Course—Comfort's.
1.	Elements of Criticism—Kame's.
1.	History of Civilization—Guizot's.
1.	Butler's Analogy.
1.	Natural Theology—Paley's.
3.	Xenophon's Memorabilia.
1.	Conic Sections—Robinson's.
1.	Geometry—Robinson's.
1.	Greek Reader—Bullion's.
1.	International Law.
1.	Mental Philosophy—Haven's.
1.	Silliman's Physics.

In conclusion, permit me to make special mention of the following Cadets, distinguished for scholarship and soldierly qualities: John H. Drabell, Israel C. White, Benjamin W. Smith, Daniel W. Border, Chas. M. Babb, Clarence L. Smith, Frank A. Golden, M. H. Dent, E. E. Moran, John S. W. Dean, Marcellus L. Temple, William M. Howell.

With many sincere regards,
I am, sir, very respectfully,
Your obedient servant,
H. H. PIERCE,
Bvt. Capt. U. S. A., Commandant.

"D"

Rev. Alex. Martin, D. D.,
President West Virginia University:

Sir—I have the honor to submit the following report:

The course in Chemistry and Natural History, as pursued during the past year, differed in no material respect from that laid down in the catalogue of 1868-9.

Our chemical apparatus suffices for illustration of the lectures, but an expenditure of $100 in this direction would render the instruction much more effective.

The cabinet of Geology and Mineralogy is exceedingly defective. Were it not that a palaeontological collection, illustrating nearly every accepted group of rocks, has been deposited in the museum, it would be impossible to do justice to our classes next autumn.

In Natural History an excellent beginning has been made. Quite a number of birds have been presented by students, which have been skinned and prepared by Prof. Stevens and myself. Owing to lack of means for preserving other classes of vertebrates, I have been unable to accept specimens of them, many of which have been offered. For the proper encouragement of this department of the museum, it is essential to provide additional case room, and to make an annual appropriation of fifty dollars for preservatives and for vessels in which to exhibit the prepared specimens.

The study of Qualitative Chemical Analysis having been added to the scientific curriculum, it will be necessary to appropriate $100 with which to procure additional material. I recommend that all students pursuing this study in course, be required to pay for all material consumed by them, the same to be furnished by the University at cost, and that special students pay such a fee as may be determined by the faculty.

Donations to the museum have been received as follows:

Coins.—J. C. Adams, A. Carrico, A. Harris, P. C. Knox, Mrs. M. V. Layton, L. S. Layton, A. W. Lorentz and J. Wagner.

Minerals.—W. A. Hanway, J. Houston, S. S. Loar, J. W. Saer, J. Tolivar and Rev. — Willey.

Plants.—Mrs. E. J. Moore, J. Tolivar and Mrs. W. T. Willey.

Shells.—D. W. Border, M. H. Dent, Miss H. L. Dering, Dr. H. B. Lazier, W. L. Ledwith.

Birds,—J. W. Darlington, N. B. Harding, J. Dunkin, T. B. McClure, E. E. Moran, G. C. Schafer, A. E. McLane.

Indian Relics.—C. Hewitt, C. B. Webb,

Miscellaneous.—Miss E. J. Cox, D. J. Scott.

Very respectfully,
Jno. J. Stevenson.

Morgantown, June 10th, 1870.

"D—a."

POST TERTIARY.

Saxicava rugosa. Canada.
Cardium. Isle of Desolation.
Venus. ?
Murex. ?
Equus fossilis. N. C.
" caballus. Ohio.
Elephas antiquus. Scotland.
Vertebra of Whale.(undesc'b'd.) Oregon.
Travertin. N. Y.
Calcareous tufa. N. Y.
Pressed Peat. Ireland.

TERTIARY.

Pliocene—
Infusorial earth. Bohemia.
Fusus antiquus. Eng.
Pectunculus. "
Miocene—
Fucoides targensis. Switzerland.
Platanus Reynoldsii. Wyoming Ter.
Onoclea sensibilis. " "
Populus Nebrascensis. " "
Taxodium dubium. " "
Sapindus falcifolius. " "
Glyptostrobus Europaeus. " "
Conus adversarius. S. C.
Cardium. S. C.
Balanus. Va.
Pecten Jeffersonius. Va.
" eboreus. "
Axinea abovata. "
Ostrea disparilis. "
Mercenaria permagna. S. C.
" tridacnoides. "
Charna congregata. "
Arca diluvii. Austria.
Pleurotoma aspernulata. Austria.
Scutella striatula. Cal.
Lenciscus papyraceus. Austria.
Eocene—
Silicified wood. N. J.
" " Texas.
" " "
Lignite. Vermont.
Carpolithus Brandonensis. Vermont.
" irregularis. "
Ostrea Georgiana. Ga.
Tunitella Mortoni.
Venus—3 species. St. Domingo.
Lucina—2 species "
Culcullæa. "
Arca. "
Tellina ? "
Ostrea. "
Paludina. France.
Planorbis Thiollieri. France.
Ostrea bellovacina. "
Natica mutabilis "
" sphærica. "
" calpacea. "
" Willimetti. "
" sigaretina. "
Lucina saxorum. "
Cytherea rustica. France.
" semisulrata. "
" terminsulcate. "
Crassatella sinnosa. "
Chama calcarata. "
" nesticula. "
Cardita imbricata. "
" planicostata. "
Cardium porulosum. "
Turnitella carinifera. "
" sulcata. "
" intermedia. "
Cerithium acutum. "
" calcitropoides "
" concavum. "
Potamides. "
Volutilithus spinosus. "
Ancillaria dubia. "
" buccinoides. "
Pleurotoma. "
Buccinum stromboides. "
Capulus cornu-copiæ. "
Trochus. "
Fusus bulbeformis. "
" longævus. "
" semiplicatus. "
" pyrus. "
" noc. "
" ———. "
Pyrula levigata. "
Nummulites variolans. "
" constrictus. "
" mummularis. Syria.
Terebra. Savoy.
7 Species. N. J.
Octodus. "
Carcharodon megalodon. S. C.
" angustideas. "
Oxyrrhina. "
Ribs of Manatee ? "
Humenis (?) of Manatee. "
Scutella. Ga.

MESOZOIC.

Cretaceous—
Juglans Debeyana. Dacotah.
Roots of Plants. N. J.
" " Ferns. "
Lignite. "
" with pyrites "
Ananchytes ovatus. Eng.
Micraster cor-auguinum. Eng.
Cidaris glandifera. Syria.
Hemiaster Baileyi. Eng.
Siphonia lobata ? "
Trochosmilia conoides. N. J.
Belemnitella mucronata. "
Turrilites polyplocus. Westphalia.
Baculites ovatus. Dacotah.
" compressus. "
Hamites rotundus. Eng.
Ammonites. Dacotah.
" splendens. Eng.
" Rhotomagensis. France.

Eocene cont.—
Ammonites varians. Eng.
Dentalium ellipticum. "
Natica Gaultina. "
" clementina. "
" ———. N. J.
Trochus Gibbsii. Eng.
Cinulia inflata. "
Rostellaria carinata "
Three undescribed species. Syria.
Ostrea larva. N. J.
Plicatula pectenoides. Eng.
Nucula omatissima. "
" ovata. "
" ———. ? "
Inoceramus sulcatus. Eng.
" Nebrascensis. Dacotah.
" Sagensis. "
Gervillia anceps. Eng.
Lima spinosa. "
" ———. N. J.
Cardium mullestriatum. N. J.
Cuccellaea vulgaris. "
Gryphaca vesicularis. "
" " Bavaria.
" columba. Bohemia.
Terebratula. Eng.
" subrotunda. Eng.
" Harlani. N. J.
Terebratella plicata. "
Pecten tenuitesta? "
Exogyra costata. "
" arietina. Texas.
Mactra. Dacotah.
Six other species. N. J.
Etyris Martini. Eng.
Palæocorystes Stokesii. Eng.
Teredo tibialis. N. J.
Vertebræ of Fish. Eng.
" Shark. N. J.
" Thoracosaurs neo-cæsarensis. N. J.
" Mosasaums. "
Six species of shark's teeth. N. J.
Otodus appendiculatus. Eng.
Phalanx of Thoracosarus? N. J.
Coprolite. N. J.
Fish remains. Syria.

JURASSIC.

Cadites serpentinus. Bavaria.
Thecosmilia trichotoma. Wirtemburg.
Pentacrineus Briareus. Eng.
Hemicidarus crenularis. "
Belemnites densus. Wyoming.
" giganteus. Germany.
" tribularis. Eng.
" mucronatus. "
Ammonites armatus. "
" bisulcatus. Germany.
" margaritatus. Eng.
" communis. "
" bifrous. "
" polyplocus. Bavaria.
Ammonites serpentinus. Eng.
" ——— "
" planocostatus. "
" Birchii. "
" Beckii. "
" fimbriatus. "
" oxynotus. "
" ——— "
" Loscombei. "
" Lambertii. Russia.
" biplex. Eng.
" Calloviensis. "
Nautilus truncatus. "
Gryphaea incurva. "
Lima gigantea. "
Pholadomya fidicula. "
Modiola imbricata. "
Amphidesma decurtatum. "
Terebratula plicata. "
" ornithocephala "
" Phillipsii. "
Pleurotomaria. "
Trigonia costata. "
Rynchonella obsoleta. "
Patella rugosa. "
Limulus. Bavaria.
Libellula. "
Eryon orbiculatus. "
Atrympos sepidens. "
Galeus pristodontus. Eng.
Vertebra of Icthyosaurus. "
Pholidophorus latiusculus. "
Palatal teeth of Shark. "
Coprolite. "
Leptolepsis sprattiformis. Bavaria.

TRIASSIC.

Silicified wood. Nevada.
" " N. J.
Stigmaria. "
Voltzia heterophylla. "
Glassopteus Browniana. Australia.
Zamites obtusifolia. Va.
Avicula socialis. Germany.
Ceratites nodosus. Germany.
Fisha. Conn.
Track of Brontozoum. Mass.
" " Sillimanium. "

PALAEOZOIC.

Carboniferous
Productus aculeatus. Germany.
Palaeoniscus Freiseslebeni. Prussia.
Productus punctatus. Ills.
Productus semireticulatis. Ohio.
" tubulospinus. Ind.
" eostatus. Ills.
" Nebrascensis. Ills.
" ——— O.
Orthis Michelini? Ohio.
Spirifer lineatus. Ills.
" cameratus. Ills.
" 2 species. "
Aviculoputen. Ohio.

Chonetes mesoloba. Ohio.
" granulifera. W. Va.
Athyni subtilata. Ohio and Ills.
Discina nitida. " "
Goniatites. " "
Pleurotomaria Grayvilliensis. Ills.
Avicula. "
Bellerophon carbonarius. W. Va.
Myalina subquodrata. "
Two other species. "
Cardiomorpha Missouriensis. "
Spirifer octostriata? Ohio.
Lepidodendron rimosum. Penn.
" obovatum. "
" carinatum. "
" clypeatum. "
" giganteum. "
" elegans. O.
Lepidostrobus ornatus. "
Sigillaria alternata. Penn.
" ——— O.
" Menardi. "
" Yardleyi. Penn.
" attenuata. "
" dentata. "
" biloba. "
Syringodendron pachyderma. Penn.
Stigmaria ficoides. W. Va. and "
" var. umbonata. O.
Calamites dubius. Penn.
" approximatus. Ohio.
" Suckovii. "
" ——— Penn.
" cannaeformis. O.
" arenaceous. "
Neuropteris hirsuta. Penn.
" rarinervis. Ills.
Pecopteris unita. "
" villosa. "
" Miltoni. Penn.
Cyclopteris elegans. "
Sternbergia transversa. O.
Lepidophyllum acuminatium. Penn.
Cardiocarpum. O.
Trigonocarpum tricuspidatum. O.
" olivaeformae. "
Annularia longifolia. Ills.
" brevifolia. O.
Asterophyllites phones. O.
" longifolia. Penn.
Sphenophyllum Schlotheimii. "
Hymenophyllites Hildrethii. O.
Callipteris Sullivanti. Ills.
Annularia sphenophylloides. Ills.
Asterophyllites equisetiformis. "
Alethopteris Serlii. "
Eurylepis tuberculatus. O.
" minimus. "
Pentremites florealis. Ala.
" Godonii. "
" pyriformis. "
Fenestella retiformis. "
Archimedes reversa. Ills.
Archimides Owenana. Iowa.
" Wortheni? Ills.
Zaphrentis dalii. "
" Spinulosa. "
Taxocrinus ramulosus. Ind.
Poteriocrinus spinosus. Ills.
" ——— "
" Missouriensis. Mo.
Anus of Crinoid. Ills.
Leacrinus ——— "
Actinocrinus rotundus. Iowa.
Cyathophyllum flexuosum. Ills.
Lithostrytion Canadense. "?
Bryozoan mollusks. "
Productus magnus. Wis.
" semi-reticulatus. Ala.
" Altonensis. Ind.
" ovatus. Mo.
" Prattenanus. W. Va.
" muricatus. "
" Longispinus. "
" pyxidatus. "
" Burlingtonensis. Iowa.
" punctatus. "
Camarophoria subtrigona. Ills.
" Ottumwa. Iowa.
Rynchonella pustulosa. "
" explanata. "
Spirifer Leidyi. W. Va.
Athyris ambigua. Ills.
Schizodus Chesterensis. Ills.
Allorisma sinuata. "
Discina Newberryi. O.
Lingula Melia. "
Streptorhynchus umbraculum. Ills.
Goniatites striatus. Ireland.
Spine of Ctenacanthus. Iowa.
Tooth of Cladoduslamnoides. Ills.
" " Helodus crenulatus. Ills.

DEVONIAN.

Chemung Groups—
Lycopodites Vanuxemi. N. Y.
Two new species of plants. "
Strophomena, 2 species. "
Ambocoelia gregaria. "
Spirifer mesacostatis. "
" levis. "
" 3 species. "
Orthis leonenis. "
" 4 species. "
Atrypa aspera. "
Rynchonella. "
Pinopsis. "
Lucina retusa. "
Pteronites Chemungensis. "
Orthoceras. "
Six other species. "

Hamilton Groups—
Cyathophyllum coespitosum. Germany.
" 3 species. N. Y.
Zaphrentis Halli. "
Cystiphyllum Americanum. Canada.
Favosites polymorpha? N. Y.

Favosites basaltica.	N. Y.
“ ———	“
Streptelasma erecta.	“
Heliophyllum Halli.	“
Michelina stytopora.	“
Dolatoerinus liratus.	“
Chonetus setigera.	“
“ coronata.	“
“ deflecta.	“
Tropidoleptus carinatus.	“
Athyris spinferoides.	“
Atrypa reticularis.	“
“ aspera.	“
Strophodonta nacrea.	“
“ interstrialis.	“
“ perplana.	“
“ concara.	“
Orthis Tulliensis.	“
“ leucosia.	“
“ Vanuxemi.	“
Calceola sandalina.	“
Rhynchonella venustula.	“
“ Horsfordii.	“
Ambocoelia cembonata.	“
Spirifer Macronus.	“
“ mucronotus.	“
“ granuliferus.	“
“ mediales.	“
“ ———	“
Nucleospira concinna.	“
Grammysia ———	“
“ alveata.	“
“ bisulcata.	“
Lucina lirata.	“
Cypricardites concentrica.	“
“ alta	“
“ ———	“
Minodon bellitriata.	“
Avicula erecta.	“
“ ———	“
Pterina quadrula.	“
Avicula flabella.	“
Nuculites oblonga.	“
“ bella.	“
“ constricta.	“
Butamerella papilliensis.	“
Orthonota undulata.	“
Lingula concentrica.	“
Discina lodensis.	”
” minuta.	”
Goniatites?	”
Loxonema Hamiltoniae.	”
Plemotomaria lineata.	”
Spirorbis angulatus.	”
Calymene bufo.	“
Homalonotus Dekayi.	”

Upper Helderberg Groups—

Fucoides canda-galli.	N. Y.
Syringopora?	”
Cyathophyllum, 4 species.	”
Crinoid.	”
Favosites Goldfussi.	”
Phillipsastrea Vernenilli.	Ky.
Tentaculites scalaris?	O.
Corals, 4 species.	N. Y.
Atrypa reticularis, 2 var.	”
Spirifer acuminatus.	Ky.
Arthoceras foliatum.	N. Y.
” ———	”
Cyrtoceras Eugenium.	”
Pleurotomaria?	”
Lucina. Ky.	
Two other species.	”
Calymene platys.	”
Trilobitis, 2 species.	”

ORISKANY SANDSTONE.

Orthis hipparionyx.	N. Y.
Spirifer arrectus.	”
” arenosus.	”
Rensselaeria ovoides.	”
“ ovalis.	”
Rhynchonella oblata.	”
Strophodonta Lincklaeni.	”
Muista lata.	”
Eatonia peculiaris.	”
Platyostoma ventricosum.	”
Platyceras magnificuni?	”
Leptocoelia flabellites.	”

UPPER SILURIAN.

Lower Helderberg Groups—

Favosites Helderbergiae.	N. Y.
Stromatopora, 2 species.	”
Mariacrinus stoloniferus.	”
“ macropetalus.	”
Undetermined crinoids.	”
Apiocystis Gebhardii.	”
Caninia Helderbergiae.	”
” ” ?	Md.
Fenestella.	N. Y.
Four other species.	”
Astylospongia inornata.	”
Aspidocrinus scutteliformis.	”
Tentaculites ornatus.	”
” elongatus	”
Strophomena rugosa.	”
Strophodonta Beckii.	”
” varistuata.	”
” var. arata.	”
” punctilifera.	”
” planulata.	
Strophodonta, two species.	N. Y.
Atrypd reticularis.	“
Pentamerus galeatus.	“
“ pseudogaleatus	“
“ Verneuillii.	“
Rhynchonella equivalois.	“
“ pyramidata.	“
“ nucleolata.	“
“ formosa.	“
“ altiplicata.	“
“ vellicata.	“
“ ventricosa.	“
“ four species.	“
Spirifer concinnus.	“
“ perlamellosus.	“
“ cyclopterus.	“
“ macropleurus.	“
“ vanuxenei.	“
Discina discus?	“
Eatonia singularis.	“

Eatonia eminens.	N. Y.
Leptocoelia imbricata.	"
Megambonia aviculoides.	"
Lingula.	"
Merista bella.	"
" princeps.	"
" arcuata.	"
Avicula communis.	"
" obscura.	"
Trematospira, two species.	"
Othis oblata.	"
" subcarinata.	"
" varica.	"
" five species.	"
Rensselaeria equiradiata.	"
" mutabilis.	"
Platyceras elongatum.	"
" ventricosum.	"
Platyostoma ventricosum.	"
Tellinomya nucleiformis?	"
Orthoceras longicameratum	"
Cyrtoceras subrectum.	"
Beyrichia notata.	"
Leperdita alta.	"
Dalmania pleuroptyx	"
" micrurus.	"
Homalonotus Vanuxemi.	"

NIAGARA GROUPS.

Arthophycus Harlani.	N. Y.
Buthotrephis gracilis.	"
" " var. crassa.	"
Rusophycus bilobatus.	"
Fucoides heterophyllus.	"
Chaetetes lycoperdon.	"
Zaphrentis bilateralis.	"
Halysites catenulatus.	"
" agglomeratus.	"
Favosites ———.	?
" Niagarensis.	N. Y.
Astrocerium pyriforme	"
" ?	?
Stromatopora concentrica.	N. Y.
Ceramopora imbricata.	"
Stictopora punctipora.	"
Stephanocrinus angulatus.	"
Caryocrinus ornatus.	"
Graptolithus Clintonensis.	"
Cyathophyllum ceratites.	Germany.
Lingula cuneata.	N. Y.
Pentamerus oblongus.	"
Leptocoelia hemispherica.	"
Leptaena subplana.	"
" transversalis.	"
Eichwaldia corallifera.	"
Orthis elegantula.	"
" flabellum.	"
Strophomena rugosa.	"
Atrypa (Triplesia?) congesta.	"
Atrypa reticularis.	"
Spirifer radiatus.	"
" Niagarensis.	"
" Crispus?	"
Palaearca primigenius.	"
Modiolopsis orthonota.	"
Pleurotomaria pervetusta.	"

Niagara—

Platyostoma Niagarensis.	N. Y.
Avicula, ?	
Cyclonema. ?	"
Orthoceras annulatum.	"
Homalonotus delphinocephalus	"
Lichas Boltoni.	"
Tracks of crustaceans.	"
Fossilliferous iron ore.	"

LOWER SILURIAN.

Hudson River and Cincinnati Groups—

Buthotrephis subnodosa. N. Y.
Petraia corniculum. Ohio.
Chætetes lycoperdon. N. Y.
" ———. Ohio.
Strophomena alternata. N. Y. & Ohio.
" alternistuata. "
" tenuistrata. "
Leptæna planoconvexa. "
" ———. "
" sericea. N. Y. & Ohio.
Orthis testudinaria. "
" erratica. N. Y.
" plicatella. Ohio.
" lynx. "
" subquadrata. "
" occidentalis. "
" sinuata. "
Zygospira modesta. "
Rhynchonella increbescens. Ohio.
Ambonychia radiata. N. Y. & Ohio.
Avicula demissa. N. Y.
Modiolopsis modiolaris "
Cyrstolites ornatus. "
Murchisonia gracilis. "
Cyclonema bilix. Ohio.
Ormoceras crebriseptum. N. Y.
Endoceras proteiforme. "
Calymene senaria. "
Asaphus gigas. Ohio.
Graptolithus pristis. N. Y.
" ramosus. "
" vicornis. "
" mucronatus. N. Y.
Triarthus Beckii. "

Trenton Groups—

Stenopora fibrosa? Iowa.
Maclurea magna. "
Orthoceras vertebrale. Illinois.
Receptaculites Owenii. Iowa.
Pleurotomaria lenticularis. Iowa.
" " N. Y.
Endoceras proteiforme. Iowa.
Phytopsis tubulosum. N. Y.
Stenopora (chæletes.) "
Diplograptus pristis. Scotland.
Strophomena alternata. N. Y.
Orthis lynx. "
Bellerophon bilobatus. "
Orthis costalis. "
Litnites undatus? "
Orthoceras amplicameratum. N. Y.
Murchisonia subfusiformis. Canada.
" " Iowa.

Holopea. N. Y.
Asaphus Canadensis. Canada.
Calymene senaria. Illinois.
Potsdam—
Lingula antiqua. Minn.
Dikellocephalus Minnesotensis. Minn.
Conocephalite Bayleyi. Nova Scotia.

MINERALS.

Millerite. N. Y.
Marmolite. N. J.
Verde antique. N. Y.
Ophiolite N. J.
Limonite. Penn.
Tremolite. N. Y.
Dutholite. N. J.
Epodite. N. Y.
Pearl spar. "
Cacoxene. "
Specular iron. Ohio.
Chalcopyrites. N. Y.
Iceland spar. "
Steatite. "
Mesotype. Ireland.
Wood opal. India.
Zinc Blende. Penn.
Cobaltiferous pyrites. Penn.
Silicate of Iron. N. Y.
Specimens of rocks from various places.

MISCELLANEOUS.

Two teeth of whale.
Cone from cedar of Lebanon.
Artemesia tridentata, (sage brush of western plains.)
Shell of Chelydra serpentina.
" " Cistudo virginea.
Sandstone with oyster shell attached.
Chalk bored by Pholas with shell included in cavity.

In all, about seven hundred species of fossils, represented by upwards of one thousand four hundred specimens : twenty-four specimens of minerals and rocks, and eight miscellaneous specimens. The specimen of Pentacrinus Briareus from the Dyas is undoubtedly one of the finest specimens, if it be not the best, in this country. Some of the Tertiary species are extremely rare, and to be found in but few other cabinets. There is but important group, (the Wealden,) in the whole series, unrepresented by good and characteristic fossils, so that the collection affords a most excellent nucleus for a cabinet of Geology and Palæontology.

At the time this catalogue is made out, it is impossible to give a full list of the species from the Chemung and Upper Helderberg Groups of New York, as Prof. Hall's fourth volume has not been received, which contains descriptions of the Devonian Brachispoda. Few of the corals above the Niagara have been described.

[Note.—As Dr. Stevenson has had no opportunity to correct proofs of this list, it contains many typographical errors.]

REPORT OF EXECUTIVE COMMITTEE.

To the Board of Regents, West Virginia University:

The Executive Committee submits the following report of its proceedings and operations for the year ending June 14, 1870:

The Principal of the Preparatory Department submitted the name of Daniel B. Purinton for confirmation as tutor in that Department, and the Committee being satisfied that an additional teacher was required, confirmed Mr. Purinton, and fixed his compensation at $400 per annum.

In accordance with the order of your Board, the Committee directed the Treasurer to sell the Central Pacific Railroad bonds, in which the State appropriation of $10,000 to the endowment fund of the University made March 3d, 1868, had been invested. It is proper to state that the Committee directed the purchase of bonds of the same kind as those in which the endowment arising from the land grant of the Federal Government was invested, and known as "Currency Sixes," and which run for thirty years, and were issued by the United States in aid of the Central Pacific Railroad, but in carrying out the order of the Committee, by some misunderstanding the bonds of the road itself, instead of the United States issued in its aid, were purchased. After much discussion and deliberation, the proceeds of the sale of the bonds were invested as follows: $1,100 in stock of the Merchants' National Bank of West Virginia at Morgantown, at a premium of five per cent, including the accrued interest; $5,000 in U. S. 5-20 bonds of 1868, and $450 loaned to Walker Hunter, on bond and mortgage on real estate, leaving a residue of $3,450, which was loaned to the building fund temporarily upon the personal security of the members of the Executive Committee.

The labors of the Committee have been much increased during the year, in connection with the new building, but this has fallen especially heavy upon the Chairman, who is also Superintendent of Construction. The want of funds has necessitated frequent loans, which have always been granted by the bank at this place, upon the personal security of the members of the Committee. No pains have been spared to second the efforts of the Superintendent to have the Hall ready for occupation at the earliest possible moment, and the Committee may be permitted to congratulate the Board that so efficient and devoted an officer has had charge of that department of the interests of the Institution. Mr. Hagans has given almost exclusive attention to the work with which he has been charged, even to the detriment of his own interests, and the Committee think he should, and doubtless will, receive suitable recognition at your hands.

Insurance has been continued on the buildings and personal property during the year to the amount of $32,000, at a total cost of $322.50.

The receipts have been as follows:		
Interest on endowment, dividends, etc.		$ 5,842 00
Tuition fees		1,820 00
Received from State appropriations		30,355 00
Proceeds of bonds turned over by Monongalia Academy		1,334 28
Bal. proceeds of sale of Academy building and adjoining lot		3,656 87
Proceeds of sale of Central Pacific Railroad bonds		9,600 00
Amounts borrowed		6,853 50
Miscellaneous receipts		2 52
Balance on hand, date of last settlement		7,074 43
The disbursements have been as follows:		
Salaries of Professors	$ 8,600 00	
Salaries of other officers	1,005 00	
Investments made for endowment	7,242 50	
Paid on contracts by Executive Committee	12,012 22	
Paints, oils, &c., hardware, furnishing, &c.	1,125 66	
Books, stationery, &c., for State Cadets	581 06	
Printing catalogues, reports, &c., and advertising	592 30	
Expended on library and apparatus	506 49	
Loans repaid	7,000 00	
Disbursed by Superintendent	35,841 09	
Miscellaneous account (traveling expenses, postage, stationery, coal, freights, repairs, prizes, &c)	413 50	
Balance on hand	2,418 78	
	$66,538 60	$66,538 60

The difference between the balances reported by the Committee and the Treasurer represents the amount of College orders now issued, but not yet presented for payment, which are nearly all for payment of salaries of professors and officers.

The cost of maintaining the Cadets, including books, stationery and tuition with which they would properly be chargeable, amounts to about $1,000 per year. It will be seen upon examination that there has been a constant increase in tuition receipts since the organization of the school.

The interests of the public, as well as of the Institution, have been consulted in giving a wide publicity to the character, work and standing of the school, and its ability to afford instruction in the several departments of knowledge, by extensive advertising, and by the circulation of extra copies of the annual report and catalogue.

All the departments of instruction are in a healthy condition, and presided over by a corps of successful and popular instructors who have already established an enviable reputation for the youthful enterprise of which you are the peculiar guardians, not alone within our own borders, but in our sister States, evidenced by the presence of students from a number of the adjoining States. The utmost cordiality and harmony has prevailed between the Faculty and the Committee, and has enhanced not a little the general prosperity.

Your Committee may be permitted to congratulate the Board upon the liberal appropriation granted in aid of the *construction* and *current expense funds* of the University by the Legislature of the State, and we doubt not the same liberal spirit will characterize their action so long as the University of West Virginia shall continue to reflect credit upon the State whose name it bears.

Respectfully submitted upon behalf of the Executive Committee.

GEORGE C. STURGISS, *Secretary.*

MORGANTOWN, W. VA., *June 13th,* 1870.

Dr. *West Virginia University, in account with* James Evans, *Treasurer.* Cr.

1870.			1869.		
June 4.	To amount paid on orders of Ex. Com......	$ 61,931 38	June 16	By bal. in Treasurer's hands, last report..	$ 7,074 43
	Balance in Treasurer's hands.......	4,607 22	July 5	interest on U. S. Currency Sixes........	2,700 00
			" 6	coupons..	408 00
			" 24	G. M. Hagans (loan)......................	2,977 50
			" 31	balance Bridge Company's note........	516 42
			Aug. 10	sale of U. S. Currency Sixes.............	9,600 00
			" 23	Treasurer W.Va., contingent apr'n,'69	7,500 00
			Sept. 9	Samuel Sears, Treasurer Free Schools..	3,250 00
			Oct. 6	G. M. Hagans (loan)......................	3,876 00
			1870.		
			Jan. 6	interest on U. S. bonds..................	120 00
			" 20	" Currency Sixes..............	2,580 00
			" 31	bank dividend..............................	10 00
			Feb. 3	O. W. Miller's 3d note.	406 87
			March 14	Auditor W. Va., appropriation, 1870..	20,000 00
			May 26	" " " "	2,855 00
			April 19	George M. Reay's note..................	817 86
				sale College laws..........................	2 52
			June 14	Tuition, third College year...............	1,820 00
				Fairchild, Lawhead & Co., interest on $800, loan April 1, 1869..............	24 00
		$ 66,538 60			$ 66,538 60

OFFICE OF TREASURER WEST VIRGINIA UNIVERSITY,
MORGANTOWN, W. VA., *June 14th*, 1870.

To the Board of Regents of West Virginia University:

The foregoing exhibit of the receipts and expenditures of the University to date, is respectfully submitted to your Honorable Board, showing a balance in the hands of the Treasurer of $4,607.22.

The following bonds, notes, &c., are held by me as assets of the University:

One bond of the State of Virginia; interest due from July,'61..$	1,358	00
" " " " " " " " ..	1,642	00
Nine U. S. Currency Sixes, issue to C. P. R. R	90,000	00
U. S. 5-20 bonds of 1868..	5,000	00
Eleven shares stock Merchants' Nat. Bank, Morgantown......	1,100	00
Amount of loan to Building Fund..................................	3,450	00
Note of M. M. Dent, in attorney's hands.........................	300	00
Judgment of Monongalia Academy *vs.* Chalfant & Haymond	80	00
Note of Walker Hunter, secured by mortgage....................	450	00

Respectfully submitted.

JAMES EVANS,
Treasurer.

SUPERINTENDENT'S REPORT.

To the Hon. Board of Regents of West Virginia University:

In submitting this, my Third Annual Report, I beg leave to express a high degree of satisfaction in being able to report a generally favorable condition of affairs connected with the Department of *Grounds and Buildings.*

It is peculiarly a matter for congratulation that the main building which had been commenced and iu progress of construction when you were holding your last annual session, has been fully completed, and that heating arrangements, as well as many other fixtures, and considerable furniture adapted to the requirements for instruction in the State University, have been provided.

The operations of the past year have included, as well, various other improvement, imperatively demanded by the force of circumstances, such as grading, making roads, walks, terraces, culverts, drains, fences, &c., that the grounds might present a tasteful and attractive appearance, such as would be in full harmony with the stately and beautiful edifice, recently finished, and known as *University Hall.*

Neither have the expenditures been wholly confined to improvements of this character, as it became indispensible to remove the entire length of valley and spouting, amounting to several hundred feet, that had worn out from natural decay, and in consequence of which "College Hall" was being materially injured, the whole of which has been replaced with the best materials and in the most thorough manner. It became necessary, also, to renew a portion of the roof on the same building, as well as remove the chimney-tops as low as the roof, and build them considerably higher, thereby rendering the building more secure from accident by fire.

The pipes for conducting the water from the spring, having from long use or defective construction become useless, have been removed and replaced with wrought-iron pipes, and the entire establishment is now copiously supplied with pure, soft water. I have also provided various necessary articles of furniture for Professors' rooms, Chapel, Chemical Laboratory, Cabinets, Library, Reading room, as well as fixtures and apparatus for demonstration in the various lecture rooms.

Under the direction of the Professor of Mathematics and Military Tactics, I have had constructed a magazine, which was much needed for the safety and protection of a considerable quantity of ordnance and ordnance stores, and for the security of property and life.

Under the same direction earth-works have been thrown up, and preliminary steps taken for the construction of fortifications, such as are contemplated in the course of military instruction.

This work, I am happy to say, has been exclusively performed by the Cadet corps, assisted by the young men connected with the Labor corps During the year quite a number of the students expressed a desire to employ their leisure hours in manual labor, consequently I thought it proper to arrange for them to do so, particularly as there was much to be done in the way of grading, making roads, walks, removing a great quantity of *debris*, making fences, earth-works, &c., for which they were allowed a just compensation.

It may be proper to state that they evinced a very commendable industry and faithfulness in their part of the arrangement, and such as would encourage the proper authority to furnish more extensive facilities and opportunities in the department of manual labor.

It would seem to be desirable that those students who are being instructed in the theory and principles of agricultural chemistry should have facilities for practical application, in order to which it would become necessary to enlarge our present borders.

It has been clearly demonstrated in the construction of the new building, recently completed, that your Honorable Board acted wisely in detailing the various portions of the work, inasmuch as it has resulted in greater promptness, more thoroughness and permanency, a higher style of finish, as well as a great saving in the cost. The amount expended will not reach by nearly $25,000 as much as was estimated by various parties who were conversant with the erection of public buildings, and who were practical builders. You have reason to congratulate yourselves also on the last feature of the enterprise.

The receipts, on account of construction, from the Executive Committee, aggregate $45,844.85, and the disbursements, embracing amounts expended for new building, including heating apparatus, furniture bell, fixtures, tables, cases, desks, trimmings, repairs on "College Hall," iron pipes and out-buildings, magazine and fortifications, grading he lawn, roads, fences, &c., amount to the equal sum of ($45,884.85) forty-five thousand eight hundred and eighty-four dollars and eighty-five cents, vouchers for which amount have been submitted and examined by the committee appointed at your last annual meeting in June, 1870, to examine and audit the respective accounts of Treasurer, Executive Committee and Superintendent.

I hope you will find it consistent with your duty to provide means for the construction of a suitable armory building, and for the removal of the present old stable, to be replaced with one more properly located.

Respectfully submitted,

GEO. M. HAGANS,
Superintendent of Grounds and Buildings.

January 1, 1871.

West Virginia University, in account with GEO. M. HAGANS, *Supt.*

			DR.			CR.
1868.				1868.		
Oct.	Pay Roll,	Sept.	$ 541 60	Oct.	By order on Treas.	$ 541 60
	"	Oct.	1,206 29	" 31	"	1,158 99
	"	Nov.	1,573 12	" 31	"	47 30
	"	Dec.	443 60	Dec. 2	"	1,573 02
	"	Jan.	783 71	1869.	"	
1869.	"	Feb.	141 59	Jan. 2	"	411 55
	"	Mar.	422 88	" 2	"	32 05
	"	April	931 50	" 30	"	583 71
	"	May	1,899 57	April 3	"	564 47
	"	June	3,396 00	May 10	"	200 02
	"	July	3,477 53	June 3	"	1,699 57
	"	Aug.	3,170 20	" 14	"	931 50
	"	Sept.	4,511 56	" 22	"	400 00
	"	Oct.	1,187 87	July 3	"	2,895 70
	"	Nov	1,881 84	" 24	"	2,977 50
	"	Dec.	2,020 79	Aug. 28	"	500 03
1870.	"	Jan.	1,071 51	Sept. 3	"	3,300 00
	"	Feb	2,737 99	" 9	"	450 00
	"	Mar.	4,612 37	" 23	"	1,500 00
	"	April	3,382 43	Oct. 4	"	800 00
	"	May	1,798 39	" 5	"	2,000 00
	"	June	1,238 36	" 15	"	300 00
	"	April	72 17	" 25	"	350 00
	"	May	364 48	Nov. 15	"	500 00
	"	Dec.	1,317 50	" 15	"	1,200 00
1871.	Order on	Treas.	1,500 00	" 24	"	300 00
Jan. 9.	"		300 00	Dec. 2	"	1,000 00
				" 6	"	1,000 00
				" 11	"	500 00
				" 17	"	750 00
				" 31	"	1,000 00
				1870.	"	
				Mar. 9	"	3 000 00
				" 15	"	3,000 00
				" 19	"	1,500 00
				Ap'l 18	"	1,817 86
				May 3	"	1,500 00
				" 7	"	500 00
				" 16	"	500 00
				" 28	"	700 00
				June 4	"	1,200 00
				" 10	"	400 00
				July 6	"	800 00
				Sept. 19	"	1,000 00
				Nov. 10	"	500 00
			$ 45,884 85			$ 45,884 85

REPORT OF SPECIAL COMMITTEE.

To His Excellency, WM. E. STEVENSON,
Governor of West Virginia:

"At a meeting of the Board of Regents of West Virginia University, held June 14, 1870, on motion of Mr. Carskadon, the reports of the Superintendent, Executive Committee and Treasurer were referred to a special committee to be selected by the President and Secretary, from the citizens of this vicinity, not members of the Executive Committee, with instructions to the committee to submit their report with the annual report of this Board to the Governor of the State."

* * * * * *

"The President announced the committee of three heretofore authorized, to audit and settle the accounts and disbursements of the Executive Committee, Superintendent and Treasurer, as follows: John J. Brown, Chairman; Adam W. Lorentz and John C. Wagner."

A true copy from the records of the Board of Regents of West Virginia University.

GEORGE C. STURGISS,
Secretary Board of Regents.

MORGANTOWN, *Jannary 7th,* 1871.

The undersigned, to whom were referred the reports of the Superintendent, Executive Committee and Treasurer of the West Virginia University, with authority to audit and settle the accounts and disbursements of the Executive Committee, Superintendent and Treasurer, and to submit a report thereof with the annual report of the Board of Regents to the Governor, in pursuance of the annexed order of said Board, report as follows: We have examined the receipts and disbursements of the Superintendent (Mr. George M. Hagans), and ascertain that he has received on orders drawn upon the Treasurer by the Executive Committee, from October, 1868, to January 1st, 1871, the sum of forty-five thousand eight hundred and eighty-four dollars and eighty-five cents ($45,884.85), and that he has disbursed during the time aforesaid, in the erection of the new University building, and improvements to the grounds and old buildings, the like sum of forty-five thousand eight hundred and eighty-four dollars and eighty-five cents ($46,884.85).

We have examined the orders drawn for the money received, as well as the vouchers for the payment of the numerous accounts, to the persons entitled thereto, and also the accounts themselves for work done and materials furnished, in payment for which the foregoing disbursements were made, and find that the material furnished and the labor done were at fair and reasonable prices, and that the new University building is of suitable design and arrangement, of substantial material and first-class workmanship, and both internally and externally of superior finish and of elegant and imposing appearance, and reflects great credit on the Board of Regents, the Executive Committee, and especially upon the Superintendent, upon whom, during the whole period of its erection devolved the supervision of the work both in the aggregate and detail. (See the accompanying general statement, marked "Superintendent's Account of Receipts and Disbursements," also the Report of the Superintendent.)

We have also examined the report of the Treasurer (Mr. James Evans) for the year ending June 14, 1870, and find the amounts of receipts and disbursements (for which proper vouchers were furnished us) correct. The report shows a balance in the hands of the Treasurer, on the 14th of June last, of forty-six hundred and seven dollars and twenty-two cents, ($4,607.22), and the difference between this balance and the amount of the balance in his hands, as shown by the report of the Executive Committee, is accounted for by orders drawn upon the Treasurer by the committee, which have not been paid nor presented for payment at the date of the Treasurer's report.

We have also examined so much of the report of the Executive Committee as relates to the amounts received by the Treasurer for the year ending June 14, 1870, and the disbursements made by orders of the Executive Committee during the same time. The objects for which these disbursements were made will appear in detail in the report of the Committee, except the sum of one thousand two hundred and twelve dollars and twenty-two cents ($1,212.22), which was paid upon contracts made by the Committee itself in furtherance of the work, and for which we find proper vouchers; and except the further sum of thirty-five thousand eight hundred and forty-one dollars and nine cents ($35,841 09), which was disbursed by the Superintendent, and which we find also to be correct, and embraced in his general account first herein referred to, and is a part and parcel of the disbursements therein made.

Respectfully Submitted,

JOHN. J. BROWN,
A. W. LORENTZ,
JOHN C. WAGNER,
Committee.

MORGANTOWN, *January 9th*, 1871.